

CUTTING

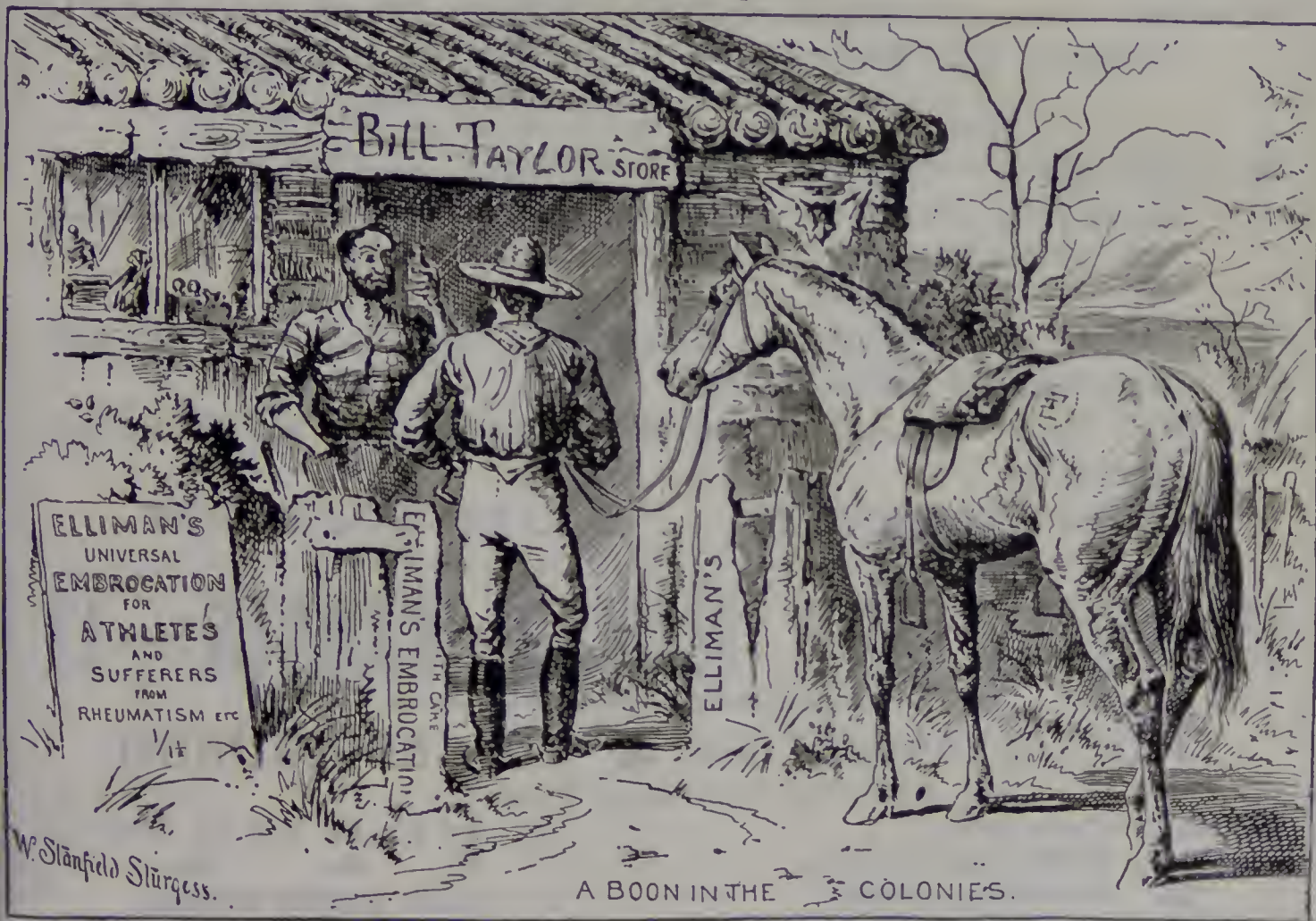
ELLIMAN'S UNIVERSAL EMBROCATION

For Human Use under 1/- and 2/4, and

ELLIMAN'S ROYAL EMBROCATION

For Horses, Cattle, and Dogs under 1/9, 2/2, and 3/-,

Can only be done by signing an agreement not to do so and then breaking faith, as all Wholesalers are pledged to secure agreements from every purchaser not to sell retail under the above prices.



A BOON IN THE COLONIES.

We invite reports of all cases of cutting under the minimum prices, but the statements must be supported by evidence—viz., a receipted bill; when we will advise all the Wholesale Houses of the address of the dealer implicated, in order that his supplies may be cut off. Quotations in Retail Lists issued prior to April, 1890, are not a certain guide to present prices, as many have fallen in with our arrangements since the lists were printed, and quotations in those lists cannot be accepted as evidence of

CUTTING.

ADDRESS—ELLIMAN, SONS & CO., SLOUGH, ENGLAND.

5—FACTS—5

"Coffee which makes the politician wise,
And see through all things with his half-shut eyes."—*Pope*.

1.—THAT THOS. SYMINGTON & CO.'S "EDINBURGH" COFFEE ESSENCES
have the Largest Family Sale throughout the World. Pure
and Strong.

"The most delicious and the rarest beverage in the world."—*Disraeli*.

2.—THAT their DANDELION COFFEE ESSENCE affords great Relief to
Sufferers from Biliousness or Indigestion, and is highly praised.

"One sip of this will bathe the drooping spirits in delight
Beyond the bliss of Dreams. Be wise, and taste!"—*Milton*.

3.—THAT their "PYRAMID" MALT EXTRACT contains more active
principle (*Diastrase*) than any other kind, and is therefore invaluable
for strengthening delicate Children and Invalids.

"Cull'd from sheaves of August gold."—*Anon*.

**4.—THAT "for the Table, the Nursery, or the Sick Room, these pre-
parations are indispensable."**

**5.—THAT those who sell or use all or any of them will favourably
remember**

SYMINGTON, EDINBURGH.

13—GOLD AND SILVER MEDALS—13

Have been Awarded the following Specialities of

THOS. SYMINGTON & CO., EDINBURGH,

For Purity and Excellence of Quality:—

Essence of Pure Coffee	...	...	...	...	In 6d., 1s., and 2s. Bottles.
Do. Coffee and Chicory	...	...	...	...	In do. do.
Do. Dandelion Coffee	...	...	...	...	In 1s. and 2s. Bottles.
"Edinburgh" Coffee and Milk	...	...	...	...	In 1-lb. Tins.
"Edinburgh" Chocolate and Milk	...	...	...	...	In do.
"Edinburgh" Cocoa and Milk	...	...	...	...	In do.
Prepared Taraxacum (Dandelion)	...	...	...	...	In $\frac{1}{4}$ and $\frac{1}{2}$ lb. Tins.
Do. do. with Pure Coffee	...	...	...	...	In do. do.
"Pyramid" Malt Extract	...	...	...	...	In 8-oz. (fluid) Bottles.
Do. do. with Cod Liver Oil	...	...	...	...	In do. do.

THOS. SYMINGTON & CO., 61 LEADENHALL ST., E.C.

HEAD OFFICE AND WORKS—BEAVERBANK, EDINBURGH.

Fletchers' Concentrated Liquors

THE FOLLOWING LETTERS OF RECENT DATE HAVE NOT BEEN PREVIOUSLY PUBLISHED.

20 UPPERHEAD ROW, LEEDS.

GENTLEMEN,

I have been much pleased with your CONCENTRATED LIQUORS for **Syrups** and **Infusions**. They are *convenient to use, and reliable*.

Yours truly,

July 19, 1890.

J. H. BEACOCK.

5 BRISTOL ROAD, WESTON-SUPER-MARE.

GENTLEMEN,

I have found your CONCENTRATED LIQUORS very convenient and satisfactory, besides being economical. They appear to me to be *exactly the thing for a small Pharmacy*. Enclosed is an order for a few more.

Yours truly,

July 24, 1890.

ARTHUR PUMPHREY.

CLOWN, CHESTERFIELD.

GENTLEMEN,

I am very pleased to bear testimony to the value of your CONCENTRATED LIQUORS for **Tinctures**, **Infusions**, and **Syrups**, which I have found to be all that could be desired, being very handy, and *saving a vast amount of time and trouble*.

Yours truly,

August 2, 1890.

W. GREAVES.

18 HIGH STREET, NEW BROMPTON.

DEAR SIR,

I continue to use your CONCENTRATED LIQUORS, and I can only reiterate what I have said before respecting them. They are *first-class preparations for saving time, labour, and loss of material*, and the results can always be depended upon.

Yours faithfully,

July 30, 1890.

JAMES STEVENS.

29 THE CRESCENT, MORECAMBE.

GENTLEMEN,

I may say, after five years' experience of your CONCENTRATED LIQUORS, I am satisfied as to their *supremacy over all others*, and also as to their uniformity in strength. I have tested successive batches of **Tinctures**, &c., made with them, and always with most gratifying results. Hence my present order.

Yours faithfully,

August 1, 1890.

J. N. CUTTS.

KIRKBY LONSDALE, WESTMORELAND.

DEAR SIR,

Your CONCENTRATED LIQUORS are *elegant, reliable, handy, and economical* preparations. I like them as well now as when I first had them.

Yours truly,

July 25, 1890.

C. PARKER.

HADLEY, SUFFOLK.

GENTLEMEN,

Your CONCENTRATED LIQUORS for **Tinctures**, &c., are *excellent*. The prices are right, the strength is right, the appearance is right, in fact they are "all right!"

Yours faithfully,

July 28, 1890.

EDWIN WRIGHT.

DORKING, SURREY.

GENTLEMEN,

I have used your CONCENTRATED LIQUORS both for **Syrups** and **Tinctures**. I find them *most satisfactory* to stock, *economical* and *handy* to use, and, as far as I can judge, of full therapeutic value.

Yours faithfully,

July 23, 1890.

F. W. DOUBLEDAY.

LOSSIEMOUTH.

GENTLEMEN,

In reply to your inquiry respecting the CONCENTRATED LIQUORS I have had from you, I have found them *very convenient and satisfactory*, and think them very suitable for country chemists.

Yours truly,

July 30, 1890.

JAMES BREMNER.

ST. MARY'S ROAD, GARSTON.

SIRS,

Having given your CONCENTRATED LIQUORS a fair trial, I have much pleasure in saying that I am perfectly satisfied with them.

I only regret that I did not use them years ago.

They are elegant, reliable, and a great saving of time—three very important considerations.

Yours truly,

July 5, 1890.

T. E. LLOYD.

Fletcher, Fletcher & Stevenson, Manufacturing Chemists,
Offices, 21 Mincing Lane, E.C. Works, Holloway, London, N.

H. GILBERTSON & SONS.

Proprietors—R. D. DIXON, JOHN DOWELL, A. B. V. TAFES.

Manufacturers & Druggists' Sundriesmen.

Terms—5% Discount Cash.—Monthly Account.

SPECIAL REDUCED PRICES OF EARTHENWARE BED PANS AND URINALS.

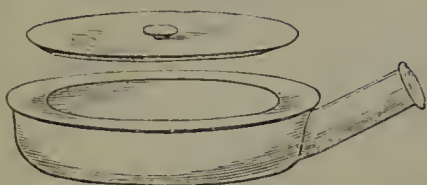


Fig. 31.

GILBERTSONS' NEW AND IMPROVED.

10-inch, 2/9 each	..	with cover, 3/6
11-inch, 3/3 "	..	" 4/-
12-inch, 3/9 "	..	" 4/6

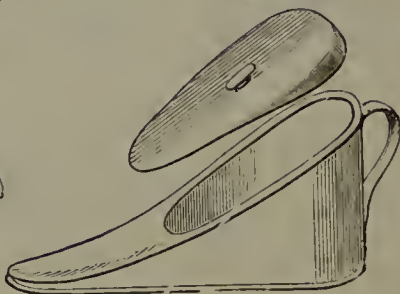


Fig. 33.

SLIPPER.

10-inch, 3/- each	..	with cover, 3/9
11-inch, 3/6 "	..	" 4/6
12-inch, 4/- "	..	" 5/-

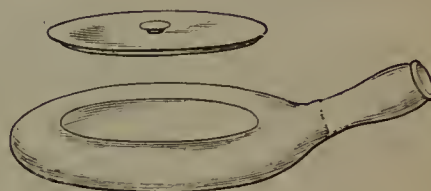


Fig. 32.

ROUND.

10-inch, 2/9 each	..	with cover, 3/6
11 inch, 3- "	..	" 3/9
12-inch, 3/6 "	..	" 4/3

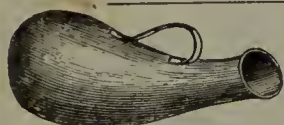


Fig. 35 (Male), 1/4 each.

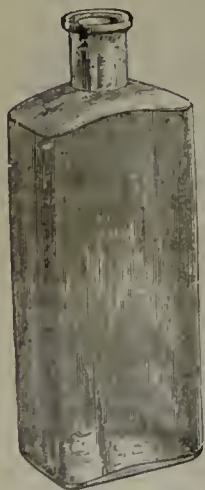


Fig. 34 (Spoonbill), 1/4 each.



Fig. 36 (Female), 1/4 each.

GILBERTSON'S REGISTERED DISPENSING BOTTLE. Rd. No. 118583.



PRICES.

1	1½	2	3	4	6	8	10	12	16	20 oz.
10/0	10/0	10/0	11/6	11/6	12/9	12/9	20/6	20/6	23/6	30/0 Green, per grs.
10/9	10/9	11/6	12/6	13/0	15/6	15/6	24/0	24/0	27/0	34/6 White, ..

IN CRATES (about 6 Gross Assorted).

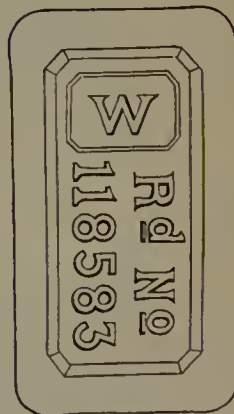
Not less than 1 gross of a size.

1	1½	2	3	4	6	8	10	12	16	20 oz.
9/6	9/6	9/6	10/9	10/9	11/9	11/9	19/0	19/0	21/6	27/0 Green, per grs.
10/3	10/3	11/0	12/0	12/6	14/9	14/9	23/0	23/0	26/0	33/6 White, ..

CRATES AND CARRIAGE FREE.

Casks for EXPORT are charged, but delivered F.O.B.

NAME PLATES EXTRA, AT USUAL RATES.

FACSIMILE OF
BOTTOM OF BOTTLE.

This Bottle is made with rounded corners without altering its flat surfaces, which not only adds to its appearance but reduces breakage to a minimum, ensuring accurate capacity, simplifying labelling, and producing a perfect appearance when wrapped.

ANY OF THE ABOVE BOTTLES ARE SUPPLIED WITH FLAT, GLOBE, OR CUT GLOBE STOPPERS.

ALSO MADE IN ACTINIC GREEN AND AMBER, SUITABLE FOR SPECIALITIES.

SPECIAL QUOTATIONS TO SHIPPERS AND THE WHOLESALE TRADE.

11 ST. ANDREW'S STREET, HOLBORN CIRCUS, LONDON.

The Chemist and Druggist

SUPPLEMENT

Businesses Wanted.
Businesses for Disposal.
Premises to Let.
Auction Sales.

SATURDAY, SEPT. 6, 1890.

Partnerships.
Situations Vacant.
Situations Wanted.
Miscellaneous.

CHEMISTS' TRANSFERS.

MESSRS. ORRIDGE & CO., 32 LUDGATE HILL, E.C.

CHEMISTS' TRANSFER AGENTS,

May be consulted at their Offices on matters of SALE, PURCHASE, and VALUATION.

The business conducted by Messrs. ORRIDGE & Co. has been known as a Transfer Agency since the year 1843, and is well known to all the leading firms in the Trade. VENDORS have the advantage of obtaining an opinion on value derived from extensive experience, and are in most cases enabled to avoid an infinity of trouble by making a selection from a list of applicants for purchase, with the view of submitting confidential particulars to those alone who are most likely to possess business qualifications and adequate means for investment. PURCHASERS who desire early information regarding eligible opportunities for entering business will greatly facilitate their object by describing clearly the class of connection they wish to obtain.

1.—**LONDON (Suburb), W.**—Good-class Retail and Dispensing Business; returns at the rate of £850 yearly, with good profits; large well-fitted shop and good stock; large house attached; small garden and lawn; about £600 required.

2.—**LONDON (City).**—Lock-up shop, Business of good class, Dispensing and Prescribing; returns last year £565, increasing, with good profits; well-fitted shop and good stock; full particulars on application.

3.—**LONDON, N.W.**—Retail and Prescribing Business; returns over £500 yearly; single-fronted, well-fitted shop and good stock, with large house; immediate possession; price £400.

4.—**KENT.**—Unopposed country Business of good class; returns over £550 yearly; large, well-fitted corner shop and good stock; good 11-roomed house, small garden, &c.; about £450 required.

5.—**NOTTINGHAMSHIRE.**—Good town; Retail and Dispensing Business of good class; returns nearly £1,100; well-fitted shop and good stock; terms, £50, goodwill, and valuation only required.

6.—**CATHEDRAL TOWN.**—An Old-established Business, excellent position, with large handsome shop; returns about £2,500 yearly; good house held on lease; applicants prepared to invest about £2,500 will oblige by giving London reference, upon which the particulars will be furnished in confidence.

7.—**NORTH DEVON.**—Country town; good-class Dispensing and Retail Business; returns £450 yearly, increasing; satisfactory reasons for selling; opposition slight; rent £20; price £300.

8.—**EASTERN COUNTIES.**—Unopposed country Business of good-class; returns between £550 and £600 yearly, with good profits; small house attached, at very low rental; vendor, having other engagements, is anxious for an immediate sale; will accept £300.

9.—**SUSSEX.**—Favourable locality; first-class Pharmacy for immediate disposal; returns £1,350 yearly; profits above the average; large stock; premises held on lease; about £1,100 required.

10.—**OXFORDSHIRE.**—Mixed Business with Post Office attached; returns about £2,000; business capable of being much increased; well-fitted shop and good stock; any reasonable offer will be considered.

11.—**HOME COUNTY.**—Within easy distance of town, Dispensing and Retail Business; returns about £550 yearly; large corner shop, good stock, comfortable house; price £450.

12.—**OXFORDSHIRE.**—Good-class increasing Business; returns at present about £400 yearly; well-fitted corner shop and good stock; good house attached; £375 required.

13.—**DORSET.**—Light Retail and Family Business; returns average nearly £550 yearly; well-fitted shop and good stock; large 10-roomed house, at low rental; vendor, having other engagements, will accept £200 from an immediate purchaser.

14.—**KENT.**—Situate in good-sized town; Retail, Dispensing, and Prescribing Business, with a good proportion of proprietary articles, rendering the business both safe and profitable; returns over £800 yearly; good house; price about £750.

Particulars of any of the above will be furnished on application.

N.B.—NO CHARGE TO PURCHASERS.

Other Businesses, Town and Country; particulars free on application. Personal applicants receive Messrs. O. & Co.'s direct attention and advice, where required, free.

TERMS FOR VALUATION ON APPLICATION. APPOINTMENTS BY POST OR WIRE HAVE IMMEDIATE ATTENTION.

Messrs. ORRIDGE & Co. invite communications from COLONIAL and FOREIGN firms where business of a confidential nature requires the especial attention of a London agent.

SPECIAL NOTICE.—TO PRINCIPALS AND ASSISTANTS.

MESSRS. ORRIDGE & Co. Register Vacancies for Situations FREE OF CHARGE.

ORRIDGE & CO., 32 Ludgate Hill, LONDON, E.C.

SALE BY TENDER.

In Bankruptcy.

Re Robert Fitton, New Street, Huddersfield,
Chemist and Druggist.

THE Trustee invites Tenders for the purchase of the Stock, Fixtures, and Business as a going concern; the shop is situate in a central position in a leading thoroughfare of the town; the fixtures and fittings are excellent, and are furnished in first-class style. Particulars and permission to view may be obtained from Messrs. Armitage & Norton, Chartered Accountants, Huddersfield.

PARTNERSHIPS.

PARTNER, with £1,000, in well-established Drug Business; good opening for young gentleman who would learn the trade. "Chemist," 48 Kremlin Drive, Liverpool. No agents.

PARTNERSHIP.—A firm of Chemical Packers, Drysalts, and Sundriesmen have an opening for a pushing and hard-working young man (distiller preferred) who, for an investment of from £300 to £500, would receive a third share in a rapidly-growing wholesale business. Full particulars, age, experience, &c., to "Magnesia," Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.

APPRENTICESHIPS.

WANTED, immediately, 2 Apprentices; passed Preliminary preferred. Rainey, Chemist, Spilsby.

APPRENTICE Wanted immediately by Thomas B. Marsden, Pharmaceutical Chemist, 112 Wilmslow Road, Withington, Manchester.

CHEMISTS.—Harrison, Parkinson & Co., Chemists, Bradford, have a vacancy for a respectable, well-educated Youth as Outdoor Apprentice; age about 16.

F. WELLINGTON, formerly Hitchcock, Chemist, Taunton, require an Apprentice; moderate premium; full particulars on application; highest references given and required.

WANTED, to place a youth aged 16 (passed Cambridge Local) with a Chemist as an Apprentice. Terms and particulars to Mr. M. H. Foster, Little Wymondley, near Stevenage, Herts.

APPRENTICE.—A vacancy occurs in a good Retail and Dispensing business for a well-educated youth; premium £45; comfortable home. Address, C. J. Price, Chemist, Walthamstow.

APPRENTICE.—Wanted, a well-educated youth; a comfortable home provided, and every opportunity given for obtaining a practical knowledge of the business; moderate premium required. G. Wilkinson, Hightown, Manchester.

F. J. BRETT,
VALUER, LEICESTER,

60 St. Stephen's Road.

*References to principal London and Provincial Wholesale Houses, also to numerous clients throughout the United Kingdom.***BUSINESSES THOROUGHLY INVESTIGATED FOR BUYERS. 20 YEARS' EXPERIENCE.****BIRMINGHAM.**—Good class suburban Pharmacy; returns £500, increasing; good house, low rent, lease; very promising business; price £550, value of stock and fixtures.**STAFFS.**—Country Retail; returns £5 to £10 week as branch; General, Retail, and Gilbey's agency; under good manager did £7 to £8 weekly in Drugs alone, and can again; price £120.**NOTTS.**—£1,100 returns; good market town; General, Retail, Prescribing, and own Proprietaries, with local Wholesale; can be much increased; price £650.**STAFFS.**—£450 to £500; fully half profits; rent £25; house fair; price £250.**KENT.**—Dispensing, Prescribing, and own Specialities; returns £855; good house; rent low; long lease; price £750.

Mr. Brett has buyers of good-class Businesses, returning £1,000 to £2,000. Vendors can at once be supplied with cash buyers.

MESSRS. BERDOE & CO.

CHEMISTS' TRANSFER AGENTS & VALUERS,

30 JEWRY STREET, ALDGATE, E.C.

Established 1870.

VENDORS will find our Office a quick medium for the Sale of genuine Businesses. Strict confidence guaranteed. Several good-class Businesses wanted returning £700 to £1,500. Town or country.**PURCHASERS** are invited to apply (stating their requirements) for particulars of businesses, sent free on application.**NO CHARGE TO PURCHASERS.****HOME COUNTY.**—Fifty miles from town.—Immediate sale; good-class Light Retail and Dispensing Business; returns over £1,450; net profit over £420; same hands nearly 20 years; excellent house and garden; price to an immediate purchaser, only £1,050.**MIDLANDS.**—Good market town.—Retail, Dispensing, and Prescribing Business; returns £1,100; net profit £350; rent £40, or lease; same hands many years; price £600, or £50 and valuation.**BIRMINGHAM** (few miles from).—Genuine Retail and Prescribing Business; returning £818; rapidly increasing; rent £20; good house and garden; net profit £364; price £500.**HOME COUNTY.**—Twenty-five miles from town.—Unopposed Retail, Dispensing, and Prescribing Business, with some Stationery; returns £900; full prices; same hands 24 years; good house and garden, greenhouse; low rent; price £175; strictest investigation allowed.**DEVONSHIRE.**—Small market town, attractive locality.—Light Retail, Dispensing, and Prescribing Business; returns £450; steadily increasing; net profit £220; rent £18; good house; price £250.**KENT.**—Large town.—Light Retail, Dispensing, and Prescribing, with large sale of Proprietary Articles; returns £650; good profits; large corner shop; best position; price £500.**NOTTINGHAM** (Suburbs).—Corner Retail and Prescribing Business; returns £6 weekly; capable of increase; rent £26; good house and premises; price £200 or offer, or valuation.**LONDON, W.**—Retail and Dispensing; returns £500; very profitable; same hands many years; good house; unopposed; price £250.

Other Businesses, town or country, from £100 to £4,000. Particulars sent free on application.

Terms for Sale and Valuation on application.

Messrs. Berdoe & Co., 30 Jewry St., Aldgate, London, E.C.

BUSINESSES FOR DISPOSAL.

3s. 6d. for fifty words; 6d. for every 10 words beyond.

FOR Sale, a genuine Retail Business in a thickly-populated district near Manchester; price £600. Apply, by letter only, to "Medicus," 17 Blackfriars Street, Manchester.**TO** Surgeons and Chemists.—A small Retail and Practice; established a number of years; through ill-health. Address, T. B., 130 Goldsmith's Row, Hackney Road, N.E.**CHEMIST'S** Business (old-established) in the City of London for disposal; grand chance seldom to be met with; cash about £1,200. Address, E., Glenliss, Balham Park, Balham.**FOR** disposal, an old-established Dispensing, Retail, and Prescribing Business, with several good proprietaries attached, in a cathedral city in the West of England. For particulars apply to W., Budleigh Salterton, Devon.**£3,500 RETURNS.**—General Retail, Prescribing, and local Wholesale; net profit £500; good house, garden, &c.; long lease; good and increasing town, within an hour of town; vendor retiring, and will give good introduction; there is ample scope for increase, and would suit two young men well; valuation about £1,200. F. J. Brett, 60 St. Stephen's Road, Leicester.**Mr. G. B. CROCKER,**Trade Valuer, Transfer Agent, & Accountant,
15 WALBROOK, E.C.**HOME COUNTY.**—Good-class Family and Dispensing; trade returns £700; price £600 or valuation of stock and fixtures.**GLOUCESTERSHIRE.**—Retail and Dispensing; returns £800; low rent; price £700; handsome pharmacy, best position in the town.**MIDLANDS.**—Unopposed Mixed Country trade; returns £900; price £600; good house and garden; handsome pharmacy.**YORKSHIRE.**—Retail and Dispensing; returns £500; price valuation of stock and fixtures; very low rent; good house and garden.**HERTFORDSHIRE.**—Good-class country trade; returns £1,350; owner retiring after many years' successful trading; price about £1,100; good house and garden.**LONDON, N.W.**—Retail and Dispensing; trade returns £520; price £500; capital position in main road.**LONDON, S.**—Dispensing trade in pleasant suburb; returns £550; net profit £250; price £500.

Valuations for Probate or Transfer conducted in any part of the United Kingdom. Terms on application.

BUSINESSES FOR DISPOSAL—Continued.**A GENUINE** old-established Business in Norfolk for immediate disposal; profits good; unopposed; exceptional opportunity; satisfactory reasons for disposal; price £1,000. Full particulars on application to Smith & Sons, Wholesale Druggists, Norwich.**TO** be sold (a bargain), a small country business situated in Midlands; returning over £300; good scope for anyone acquainted with the Agricultural trade or for combining Dentistry; owner going abroad. 171/16, Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.**NEAR** Mansfield, Notts.—Cash Retail and Prescribing, in mining place, 3,000 or 4,000 inhabitants; open 2 years; returns about £4 or £5 weekly, besides Gilbey's wine agency; rent £18, with house, &c.; nearest chemist 3 miles; must sell, proprietor leaving England; price £120 or offer. E. C. W., Phasley, Notts.**£100** will purchase small Business (N.W.) returning an average of £3 weekly, which can be doubled by pushing man, advertiser having insufficient capital to extend same; good working stock; rent £45 (£33 let off). Address, Z., Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.**£1,500 RETURNS.**—Market town, easy distance from London —Light Retail and Dispensing Business for sale, in consequence of having purchased a much larger business; good profits; cash required £1,100; applications from cash buyers only. "Bynol," Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.**£300.**—Market Town in Wiltshire—Light Retail, Dispensing, and Prescribing Business for immediate sale; returns nearly £500, good profits; convenient house and large garden; well fitted and stocked shop; £300 will be accepted from prompt buyer. Address, "Wilts," Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.**FOR DISPOSAL,** a genuine Retail, Dispensing, and Prescribing Business, with exceptionally good Proprietaries; returns £850; rent £42; lease 12 years; shop well fitted and thoroughly stocked; same hands 11 years; price £750, or reasonable offer considered; illness cause of sale. Address, "Exalgine," Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.**TO** Medical Gentlemen or Chemists.—Open Surgery or Chemist's to be disposed of; established 30 years; good house, cheap rent; most satisfactory reasons given; most populous neighbourhood (near the docks); preferable to surgeons desiring large practice; price only £360; less if taken on or before 1st of October. "Pharmacist," Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.**£160.**—BRADFORD (suburb).—Genuine old-established Light Retail, Dispensing, and Prescribing Business; prominent corner position in most pleasant part of borough; foreign wines, with certificate for spirits; returns about £250, under junior management; has done £600; satisfactory reasons for disposal; rent £24. H., Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.**BIRMINGHAM** (main thoroughfare).—For immediate disposal, genuine Retail, Dispensing, and Prescribing Business; solely cash trade; good opening for Dentistry; shop well fitted and stocked; satisfactory reasons for disposal; returns £1,000; price (including valuable lease) £750 or valuation. Apply, C. C. Smith, Son & Richards, Chartered Accountants, Colden Chambers, Corporation Street, Birmingham.**SPLENDID** Health Resort.—A Light Retail, Prescribing, and Dispensing, little Pharmacy, well fitted and stocked with best goods, in market place of country town; very profitable; no heavy trade; suitable to one in search of health; first year's drug returns £130, dentistry £31; price £120 to immediate purchaser (which is considerably under valuation); good house and garden (fruit); rent £16; genuine. Apply, T. H. Dodd, Market Place, Wolsingham, via Darlington.**SOMERSET.**—Must be sold immediately a good old-established Family Retail and Dispensing Business; owner having purchased larger concern must realise; returns over £650, increasing largely; rent £48, let off £16; splendid garden, large house, best position, good prices; business heavily stocked; good-paying proprietaries, which are well advertised; references given; this is genuine, and will amply repay strictest investigation. Apply, "Pannure," Hearn, Squire & Francis, 38 Southwark Street, London.

£100. SCARBORO'.—To be Sold, a small Mixed Business in main thoroughfare; returns nearly £300 a year; full particulars and investigation. Apply, Crane, 49 Easthoro', Scarboro'. Rent £30, clears itself by letting.

CHEMIST and Druggist Business, handsomely fitted, in densely populated locality; through exceptional circumstances will be transferred for price of fixtures. Apply, 6 London Road, Southwark. A personal interview solicited.

LONDON, N.W.—An increasing business in good neighbourhood; last year's returns £700; good Dispensing; an excellent opportunity for young man commencing; price £630. 171/11, Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.

£1,500 RETURNS.—Cheshire.—First-class Retail and Dispensing, with Gilbey's Agency; net profit about £500; thoroughly genuine Business for sale, solely on account of vendor's ill-health. F. J. Brett, 60 St. Stephen's Road, Leicester.

WANTED, about September 25, an Assistant to take charge of a Chemist's business who has sufficient cash to purchase it in a month or so; it is situated in a very busy thoroughfare in a large and prosperous seaport, and returns £550 cash under indifferent management; rent £60 on lease. Apply to Q. E. D., 16 Queen Street, Cardiff.

A n old-established Dispensing, Retail, and Prescribing Business, in a healthy country town; quite unopposed; same hands many years; good house and garden; large shop, well stocked; rent £30; returns £850; price £500. R. H., Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.

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A RELIABLE Retail, Dispensing, and Prescribing Business wanted near London, and if with opening for Dentistry preferred; returning £500 to £700; must bear investigation, and have a good residence; a fair price, cash down, will be paid to secure a suitable business. Send full particulars, in confidence, to "Minor," care of Mr. Hopkins, Pharmacist, 501 New Cross Road, S.E.

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TO LET, good Six-Roomed House and Shop, in main thoroughfare of Gainsborough; good neighbourhood and district; excellent opening for Chemist and Druggist; no other in same business within half mile; rent £22 per annum. For further particulars apply, J. Sanderson, Queen Street, Gainsborough.

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WANTED, Junior Assistant, accustomed to good-class Country trade. R. Dwyer, Folkard & Co., Pavement, York.

WANTED, Assistant who understands Country Drug and Grocery business. Apply, J. H. Dingle, Bideford, Devon.

WANTED, Traveller to call on Country Shops, Chemists, Grocers, &c. Apply to A. B., c/o Goodall, Backhouse & Co., Leeds.

WANTED, Junior Assistant, for Counter, Haymarket Stores; outdoors; hours 9 to 7. Apply by letter, stating salary required, &c., The Chemist, Civil Service Co-operative Society, 23 Haymarket, London, S.W.

WANTED, an Assistant, 20 to 22, accustomed to a good Country Retail, Dispensing, and Agricultural business; hours easy. Apply, stating age, height, previous experience, salary required, and references, to Evan Jenkins, Chemist, Faversham.

WANTED, a Junior (outdoors, short hours, no Sunday duty) for a few weeks only; fare paid one way; must have been used to first-class Retail and Dispensing; send references with application, also salary required. Guss, Chemist, Whitehaven, Cumberland.

WANTED, immediately, an active Junior; about 22; indoors. State usual particulars to C. James, Chemist, Birkenhead.

WANTED, at once, a good Junior, active and obliging. Apply, stating age, experience, and references, to A. Wright, Chemist, Lowestoft.

CHEMISTS' Assistants wanted, understanding the Extraction of Teeth or Dentistry; liberal salaries. Apply, Eskill's, 58 Ludgate Hill, E.C.

WANTED, Dispenser and Bookkeeper; £1 per week outdoor; good references indispensable. Messrs. Tomson & Son, Surgeons, Luton, Beds.

WANTED, Locum-Tenens from September 13th to 27th. Address, with full particulars, "Chemist," 4 Collyer Terrace, Gipsy Road, West Norwood.

IMMEDIATELY, qualified Assistant-Manager (outdoors). Apply by post, stating experience, salary required, &c., H. Cooper, 24 Greek Street, Soho, W.

WANTED at once, a Junior: must be well up in Dispensing and know Welsh. Address, H. D., care of Mr. John Thompson, 58 Hanover Street, Liverpool.

TRAVELLER, to represent good firm (perfumery or mineral water) in West of England. X., Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.

WET Counter.—Wanted, competent man; state salary required and with whom last employed. "Chemicus," Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.

SEPTEMBER 25.—Gentlemanly Assistant, about 26; qualified; accustomed to first-class Dispensing business. Apply, with carte and usual particulars, Jameson & Ourtis, Hastings.

IMPROVER wanted immediately, in good Chemist's business; send full particulars, and previous experience, with photo if possible; time allowed for study. H. Oliver, Chemist, West Malliog.

JUNIOR wanted (outdoors), qualified, about 21 or 22, for Dispensing and General Retail. Apply, with particulars, references, and salary expected, Proctor, Son & Clague, Newcastle-on-Tyne.

TO Travellers calling upon High-class Chemists and Fancy Dealers.—A useful Novelty to sell, suitable for Christmas presents; good commission. H. M., 70 Macfarlane Road, Shepherd's Bush, W.

DISPENSER wanted for first week in October; qualified; outdoors; no Sunday duty. State age, salary, references, if a member of any Church, &c., to the Oxford Drug Company, Limited, Oxford.

WANTED, an Assistant for a Country business; must be a good Counter hand and have good references. Apply, stating age, salary, and enclose photo, to M. Sadford & Co., Market Place, Spalding.

WANTED, a competent Assistant to manage a Branch; must be obliging and trustworthy; indoors; apply, stating previous experience, salary required, &c. R. Simon, 57 Brownlow Hill, Liverpool.

WANTED, by a Wholesale Drug house in London, a Junior Clerk having some knowledge of the trade; must be a good writer. Address, stating age and all particulars, to F. Z., Office of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.

WANTED, a Qualified Assistant (single) to take entire charge of an old established Chemist's business, with Tooth Extracting; an abstinence preferred. Address, stating age, salary required, with photo, to "Omega," 22 King Street West, Hammersmith.

LABORATORY Assistant wanted; must have a practical knowledge of making Pharmaceutical Preparations, Fine Chemicals, and others; state age, salary required, and give testimonials. Address, Dr. Tichborne, Apothecaries' Hall, 40 Mary Street, Dublin.

IMMEDIATELY, Junior Assistant, not under 21 years (indoors), for Light Retail and Dispensing business; one able to Prescribe and Extract Teeth preferred. Apply, with full particulars, enclosing photo, to "Dispenser," Messrs. Southalls, Birmingham.

SEPTEMBER 30. An Indoor Assistant; able to Extract Teeth; trustworthy, competent to take charge; must be obliging, quick, and active; abstainer and one used to small Country Wholesale preferred. Apply, with full particulars, and enclose photo, Fardon & Co., Maidstone.

WANTED, a thoroughly practical and obliging man, with good all-round experience as Senior, also a quick and accurate Dispenser; indoors; short hours and a comfortable home. Apply, stating previous engagements, salary required and usual information, photo, to Mr. Brew, 10 Church Street, Malvern.

ASSISTANT (outdoors); hours easy; must be able to Dispense and Extract Teeth, and accustomed to put up patent medicines; competent to take charge during absence of principal. Send age, height, photo (to be returned), how long in last place, salary, &c., William Seedhouse, Leighton Buzzard.

WANTED, a good Assistant (single) for a Country trade, in a small Wholesale and Agricultural business; one preferred who has been used to Travelling occasionally; qualification not necessary; easy hours; exceptional terms to suitable party. "Veritas," Messrs. Barker, Staggs & Morgan, 15 Laurence Pountney Lane, London, E.C.

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IMMEDIATELY.—Junior Assistant, accustomed to Dispensing; about 22; Minor qualification preferred. State salary (outdoors), height, references, and usual particulars, to Dyer, Chemist to the Queen, Halifax.

IMMEDIATELY, a good Junior Assistant, not under 20 years (indoors); light trade; time for study. Apply, stating previous experience, references, salary required, enclosing C.D.V., to W. Jacobs, Medical Hall, Guildford, Surrey.

A JUNIOR Assistant; one just out of his apprenticeship; soon; indoors; apply, stating age, height, salary, when disengaged, with photo, to be returned; abstainer, and have passed the Preliminary. George Windeatt, Wellington, Somerset.

ENERGETIC, qualified; outdoors; Assistant to manage a mixed retail in the absence of proprietor; must be a good salesman and well able to prescribe or extract teeth. Apply with carte, stating age and salary required, to Hartley, Chemist, Elton, Bury.

IMPROVER or Junior, in Light Country Business; Churchman, and one used to country business preferred; time allowed for study. State age, height, reference, salary required indoors, and photo if convenient, to J. Gibbs, Chemist, Upton-on-Severn, Worcester.

WANTED, 2 good Junior Assistants for Mixed business; must be well up in the trade for branch or principal establishment. Apply, stating salary required (indoors), experience, references, and enclose photo (which will be returned), to J. Day, Chemist, South Town, Dewsbury.

WANTED, Manager for Branch; permanency; qualified Prescriber and Tooth Extractor; must be pushing and energetic; married (no family preferred); house and garden attached to branch, rent, &c., free; state terms. Send photo and testimonials to J. H. Heap, Chemist, Hanley.

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ASSISTANT: Minor; outdoors; good references. Jones, 51 Bedford Street, Cardiff.

JUNIOR: aged 18; 1 year's experience; to sleep out preferred. "Junior," 412 Hackney Road, N.E.

JUNIOR: over six years' experience; north preferred. F. Lawson, Peter Street, Workington.

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JUNIOR (20); London preferred; disengaged September 16th; good reference. Anthony, Chemist, Cardiff.

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BY a qualified Chemist, situation as Locum-Tenens or Manager; highest reference. Davey, 65 Vestry Road, Camberwell.

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ADVERTISER (25) desires situation in Laboratory, or otherwise; good references; South or S.W. of England preferred. "Chemist," Steine House, Brighton.

AS Branch Manager; married; qualified; aged 27 years; 5 ft. 8 in.; 11 years' good varied experience. "Chemist," 34 Oxford Street, Mountain Ash.

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AS Assistant (27); married; to manage a branch Mixed business; 13 years' experience; good references. "Manager," Day, Chemist, Dewsbury.

JUNIOR; passed Prelim.; good references; disengaged; 5 years' experience; abstainer; good address; photo. X. Z., 59 Trinity Street, Bury.

ASSISTANT or Traveller, or either: aged 30; last situation 7½ years; good references. W. Flight, Brimscombe, Stroud, Gloucestershire.

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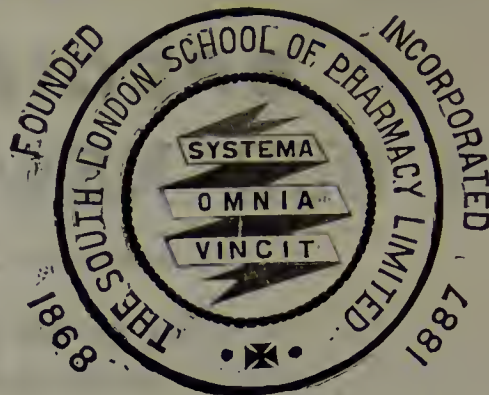
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9th.—If you start upon your holiday without a "Demon," you will regret it from start to finish. The old churches, the beautiful scenery, the comic incidents, the friends and companions all will be missed; you will see others snapping pictures during their travels from every available spot, like bees gathering honey, but you, alas! will only serve as a principal figure in a group of disconsolates who started for a holiday without a "Demon."

10th.—If you are still dubious in the face of 70,000 unsolicited testimonials from those who have purchased, make yourself doubly secure by writing for specimen pictures taken with the "Demon," and see what others can do who knew nothing about photography until they made a friend and companion of the "Demon."

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CAUTION.—Address all Orders to Manager, "C. D." Department, latter address.

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TEBBUTT'S COMBINED PERCOLATOR & PRESS,

For the Preparation of Tinctures, Fluid Extracts, & Concentrated Infusions,

Supplies a long-felt want, the methods hitherto employed being wasteful and unsatisfactory. The results of its use are an exhausted Marc and a superior Preparation, with absolutely no loss of Spirit

TESTIMONIAL.

Tower Chambers, Moorgate Street, E.C., September 12, 1889.
Dear Sir,—We have much pleasure in telling you that your patent Percolator has given us very great satisfaction. We find that the marc, whether it be that of a Tincture, Fluid Extract, or Concentrated Infusion, is thoroughly exhausted after percolation is complete, also that there is a great saving of spirit.
We may add that at the last meeting of the British Medical Society, held lately in Leeds (August, 1889), we exhibited our Fluid Extracts made with your Percolator, and they attracted a great deal of attention by their excellence.—*Vide* "British Medical Journal," Sept.; and "Provincial Medical Journal," Sept. 2

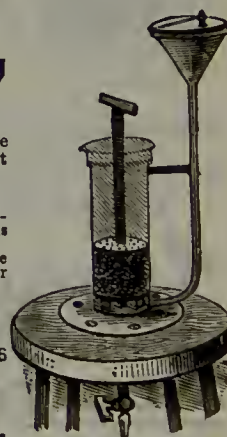
Yours truly, CHAS. GREEN & CO.

PRICES WITH STAND COMPLETE:—

To make $\frac{1}{2}$ gall. of Tincture, such as Gentian, 15/6. To make 1 gall. of Tincture such as Gentian, 22/6

Orders should be accompanied with a remittance, addressed to

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Repairs and Post Orders Despatched Same Day.

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Is used at meals in the same quantities as, and in lieu of, ordinary table salt

The Lancet, May 20, 1890, says:—"In Pepsalia we have a convenient means of aiding digestion."

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The Medical Press and Circular, April 16, 1890, says:—"Pepsalia gives evidence of great digestive activity."

Dr. HEHNER, the eminent Analyst, says:—"Pepsalia, when used as an ordinary table salt, exercises powerful solvent action upon nitrogenous materials."

G. & G. STERN have received numerous Testimonials from Medical Men with reference to Pepsalia.

M.D., &c., Cavendish Square, writes, July, 1890:—"During the short time I have been trying your **PEPSALIA** upon myself I have acquired the greatest benefit from it."

"An indigestion which has been slowly growing, resulting in flatulence, discomfort, and sleepiness after meals, general lassitude and depression, has with all these disagreeable symptoms vanished as by a charm since I commenced merely substituting **PEPSALIA** for ordinary table salt with my dinner."

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M.D., M.R.C.P., London, writes:—"I have used **PEPSALIA**, and am much pleased with it. It acts well as a digestive, and it gives me pleasure to recommend it to my patients."

F.R.C.S., London, writes:—"I consider **PEPSALIA** a good digestive, having taken it myself for dyspeptic symptoms with great benefit."

Price 1s. and 2s. per Bottle. To Chemists, at 10s. and 20s. per Dozen, less 5 per cent. discount.

G. & G. STERN,
62 GRAY'S INN ROAD, LONDON, W.C.

Will send Samples for distribution among Medical Men, and Literature, free on application.

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This Section of "The Chemist and Druggist" must be closed for press by Thursday noon of each week.
Remittances payable to EDWARD HALSE.

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Advertisements in this department must be paid for in advance. From this rule no deviation can be made. Insertions are charged at the rate of 1d. per word, provided the advertiser attaches his name and address, for each word of which he must also pay at the same rate; or if he pays 1d. per word, his name and address will be registered and a figure attached to his advertisement. All correspondence referring to that figure must be addressed to "The Publisher of THE CHEMIST AND DRUGGIST, 42 Cannon Street, E.C.," and the figure must be distinctly endorsed upon the envelope. Letters will then be forwarded to their proper destination. A price is counted as one word, as e.g., £1 10s. 6d.

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Brooks's Recipes.—Depurative saline, perfectly soluble, 10d. lb.; "Sweet Memories," new invigorating bouquet; oatmeal and white rose lotion, specialty for seaside, cooling and purifying; the specific, magic cure, instant action, very reliable; recipes, with instructions, post free 7d. each, 3 for 1s. 6d.; list of 400 free. Tom Brooks, Chemist, Hornsey, N.

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Gilt show mortar for outside. 170/30.
Brass pastille mould, show jar, fig. B Maw, wax face for spectacles. Hasselby, St. Leonards.
4 gross 1½ oz. bottles, shape as Kay's Linseed; 1 gross 1 lb. bottles, as Kepler's extract. Morris, Chemist, Thame.
Six-gallon carboy, mahogany stand, bargain, 20s.; bent glass show-case, as A13, page 508, Maw, 48 in. by 12 in., £3; also three other cases. On view, at Lewis's, Chemist, Acton, W.
8 20, and 40 oz. wide and narrow-mouthed shop rounds; 10 4-lb. blue jars; 2 and 3 gall. carboys; 1 and 4 gall. carboys; 5-gr. pill machine. Offers to F. E. Bell, Hamsterley Road, Newcastle.
Dispensing-screens, nests of drawers, desk and case, wall-cases, sponge-cases, carboys, and everything suitable for chemists; great bargains. Philip Josephs, 54 Old Street, Goswell Road, London.

Second-hand shop fittings, show-cases, shop-rounds, specle-jars, carboys, pill-machines, utensils, and every necessary for chemists commencing or fitting up branch shops, at half the usual prices; state requirements or call. Natali & Co., 184 Aldersgate Street, London, nearly opposite Maw's.

A large quantity of chemists' fittings and utensils, very cheap; or exchange. Wall-cases, counters, counter-cases, sponge-cases, desk and cases, dispensing-counters, dispensing-screens, drawers, lockers, shelving, cornices, upright cases for wall and counter, drawers for under counter; a number of silvered glasses in frames, several with 1-inch bevelled edges; specle-jars, ointment-jars, bottles, pill-machines, scales, carboys, outside lamps (globe and square), dentists' outside cases, mortars. Send requirements, and particulars of nearest, with drawing, will be forwarded. Also a grocer's fixture, with canisters, butter block, scales, dummy cheese, &c., &c. Ekansh Natali, 207 Old Street, London (almost opposite Great Eastern Street).

12 ft. run of (60) mahogany drawers, lockers, shelving, uprights, &c., at low price; ditto, with silver plate-glass cupboard between the shelving (over drawers), 10 ft., 12 ft., 16 ft., and 20 ft. run at low prices; piano wall-case, as Maw's A 83, 8 ft. long, to be sold a bargain; dispensing-screens, as A 54 and 55, Maw's list, 4 ft., 5 ft., and 6 ft., from 70s.; wall-cases, as Maw's A 83, 7 ft. 6 in. long, 9 ft. high, mahogany, polished, cheap; ditto, ditto, 6 ft. long, stained as mahogany, 7 ft. 10s.; ditto, 3 ft. 2 in. long, and 7 ft. 9 in. high; sheet-glass wall-case, 42 in. long by 49 in. high; ditto, 45 in. long by 46 in. high; ditto, 49 in. high by 23 in. wide; ditto, 43 in. high by 58 in. long; ditto, plate-glass, 63 in. high by 51 in. long, all at low prices; glass show-stands, as Maw's, fig. 4, 5, 6, at low prices, as Maw's A 37; mahogany counter, 15 ft. by 52 in., with carved trusses and drawers at back; ditto, 11 ft. 6 in.; several others cheap; a cheap line of pine counter, mahogany top, from 6 to 12 ft., cheap. Ekansh Natali, 207 Old Street (shoreditch end), London, E.C.

Miscellaneous.

Pair crutches, Maw's No. 3, almost new; what offers? 165/10.
Sponge-case for sale, elegant and effective for display; bargain. Chemist, 7 Clarendon Street, Nottingham.

Small stock of saleable patents, clean and in good condition; send stamp for list. 171/40.

Raphael's optometer, empty glycerine tins, ess. lemon coppers for sale or exchange; offers. Webster, West Bromwich.

Microscope, good serviceable, magnifies 450 times, in polished wood case; value 5l. 5s.; post free for 3l. Millar, Woodhurn Place, Edinburgh.

Job lots of mineral-water and other bottles; 100 gross split lemons; 50 gross 10-oz. square dark coffee extracts; 30 gross cherry brandy quarts; what offers to clear? 85/61.

Spectacles (Herbert & Godfrey's), condition equal to new, various sizes retailing from 1s. to 8s. 6d.; low price to clear; giving up the trade; return if not approved. Temple, Chemist, Hessele.

New run honey, 6d. lb.; paraffin mol. and paraffin dura, 4½d. lb.; insect powder, 1s. 2½d. lb.; citrate magnesia, in 4-lb. bottles, 9d. lb.; arrowroot and powdered ginger, 4d. lb.; samples of either, three stamps. Johnson, Chemist, Godalming.

WANTED.

Chemist's street-lamp (modern). E. Blackmore, 173 Regent Street, W.

Formula for cleaning and polishing brown leather. 168/30.

Shop-fittings, &c.—All descriptions purchased for cash. Natali, 184 Aldersgate Street, E.C.
Good secondhand microscope, Zeiss preferred; must be cheap but perfect. Wm. H. Leek, Uttoxeter.

"American System of Dentistry;" 3 vols.; state price and condition. Watt, Chemist, West Hartlepool.

Tooth instruments, stopping, extracting; state full particulars about pattern, condition, and price. H. H., 4a Montford Road, Strood, Kent.

Copies of *The Chemist and Druggist* of September 21, 1889. Send to the Publisher, THE CHEMIST AND DRUGGIST, 42 Cannon Street, London, E.C.

20-oz. round, stoppered, gilt-labelled bottles, small extract-jars and ointment-jars; state price, size, &c., secondhand, and pill-machine, mortars. Hope, West Butterwick, Doncaster.

Address Wanted.

Joseph Crookes, chemist and druggist, late of Newport-on-Tay.

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IS THE
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For the production of
Botanic Beer, a non-intoxicating
beverage, full of body and
flavour, with a creamy head
like Bottled Ale. The most
perfect substitute for Alcoholic
Drinks ever discovered for
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*Numerous imitations are
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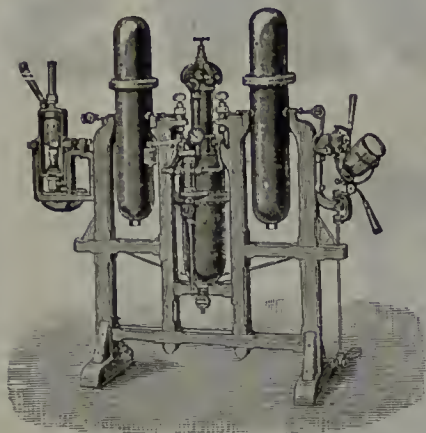
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NEWBALL & MASON, Manufacturing Chemists and Botanic Druggists, **NOTTINGHAM.**

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INDISPENSABLE TO CHEMISTS.
THE ONLY PRACTICAL SODA WATER MACHINE.

Self-working by Chemical Action. No Skilled Labour.
NOT LIABLE TO GET OUT OF ORDER OR NEED REPAIRS.
Produces the Purest Aërated Water made.

Machines, in two sizes, at 25 guineas and 30 guineas. All complete. With the smaller a lad can make easily in ten hours twenty dozen Syphons or 100 dozen Bottles; with the larger, thirty dozen Syphons or 175 dozen bottles.

COUNTY LABORATORY, 30 BROWNLOW STREET, LIVERPOOL, October, 1889.

I have examined during the present year the Machines for making Aërated Waters invented by Mr. Lozé, and I have formed a very high opinion of them. No lead is found in any part which comes in contact with the water, and the process is one which produces absolutely pure Carbonic Gas. Accordingly I find that the effervescing water produced is free from every injurious metal or contamination, and has a better flavour than that produced in the ordinary way.

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CHEMICAL LABORATORY, 20 ALBERT GATE, MANCHESTER, 21st August, 1889.

GENTLEMEN,—At your request I have visited the works of Messrs. A. Lozé & Co., of Prescott Street and Tuebrook, Liverpool. I have inspected his patented Apparatus for producing Aërated Waters, and have analysed the Aërated drinks manufactured. The results of analysis quite justified the inferences which were drawn from a knowledge of the materials used. Thus, instead of using ordinary whiting (as the source of carbonic acid gas), which gives off small quantities of offensive gases when acted upon with acid, Mr. Lozé uses one of the pure soluble bicarbonates of either Potash or Soda; the use of this salt enables the apparatus to be much simplified in form, as no gas washer is required, but the carbonic acid gas may be led at once into the liquid in the Saturating Cylinders. The Aërated drinks produced are of very high quality, both as to purity and as to Aëration, and the apparatus possesses the merit of extreme simplicity and efficiency.—Faithfully yours,

C. ESTCOURT, F.I.C., F.I.

Messrs. A. Lozé, & Co., LIMITED.

DITTON, 10th April, 1890.

Dear Mr. Lozé,—I am pleased to inform you that I have been able to work the Machine sold to me by you without previous knowledge. With your patent Turnover I can bottle Patent Stoppers at the rate of two dozen per minute. Syphons and Corked Bottles I can fill much quicker than what you advertise the Machine to do.

The Aërated Waters produced have been sampled by a number of gentlemen, and pronounced by them to be of a most excellent quality.—Wishing you every success, I remain, yours truly,

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WIESBADEN KOCHBRUNNEN SALT

FOR THE EFFECTIVE TREATMENT OF

Disorders of the Organs of Respiration and Digestion,
Catarrh of Larynx and Stomach, the Enlargement of Liver and Spleen,
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TO BE OBTAINED THROUGH ALL WHOLESALE HOUSES.

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GAZOSELTZ, for the instantaneous production of Aërated Beverages at table. Anyone can use them.

“CONTINUOUS PROCESS” Apparatus complete, guaranteed without flaw in construction, possessing perfect action, and tested to a high pressure, while fulfilling every desirable condition of economy and sanitation.

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We have recently been entrusted with a most important Agency for the above-named goods. Our Principals are the best known firm in Paris, and the Syphons are undoubtedly the cheapest and strongest in the market. The tops are made of pure English Tin, guaranteed free from lead. The Seltzogenes are made on the well-known "Fevre" system, and each one is thoroughly tested before being sent out.



WE CAN GIVE TO LARGE AND SMALL BUYERS EXCEPTIONALLY LOW PRICES.
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MELBOURNE EXHIBITION, 1889, UNPRECEDENTED SUCCESS.

We have obtained at the above Exhibition

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A feat never accomplished before by any other house supplying requirements for the Aërated Water Trade.

These awards will carry with them **THREE GOLD MEDALS**, which were awarded as follows:—

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Or Improved CODD'S.

The most perfect Bottle in the market.

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Name on Bottles free for orders of 30 gross.
Under that quantity Moulds charged 10s.
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BUY THE

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It is the cheapest, strongest, handsomest,
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Pure Black Tin Tops.

PRICE **1/6** EACH.

Nickel-plating Tops from 1½d. each.

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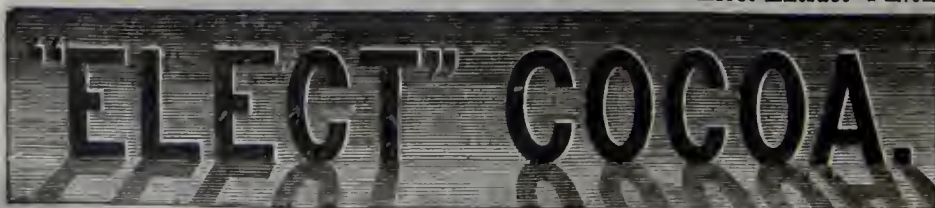
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judicious manner in which the respective ingredients have been proportioned and combined, the
Liebig's Beef Wine manufactured by Mr. B. ROBINSON, of Pendleton, Manchester.It is in every sense a reliable preparation, embodying in a pleasing and palatable form all the
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Extract of Malt, and sound Port Wine.

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Lecturer on Materia Medica in the Owens College, Manchester (Victoria University).
December 15, 1888.**ROBINSON'S ORANGE WINE.**Specially prepared for Quinine Wine, does not deposit, will keep good in any climate, and well adapted for Export Trade. Supplied in Casks
containing 9, 18, 30, 60, or 120 Gallons. Terms on application. [2]**PHARMACEUTICAL SHERRY WINE.**This Wine is well adapted for Pharmaceutical Preparations, and is the strength ordered by the B.P. Price, in 8-Gallon Casks, 5/8 per gallon; in
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The "MEDICAL PRESS AND CIRCULAR" :-

"Certainly this preparation is of delicate flavour . . . It is
perfectly soluble . . . the small quantity required for the
immediate production of a cup of excellent cocoa will ensure for this
'Elect Extract' a favourable reception at the hands of persons of
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wholesome beverage to tea and coffee."The "BRITISH MEDICAL
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is one of the best. Its flavour and
aroma are good. Cocoa thus pre-
pared is one of the most digestible
articles of food."

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MILLAR'S BRITISH WINES.**ORANGE** (suitable for Quinine), **GINGER, RAISIN COWSLIP, CHERRY, &c.****A. MILLAR & CO., Thomas Street, DUBLIN.**Sole Agents for London and District—**H. J. ROYDANT & CO., 75 Acre Lane, Brixton, S.W.**

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A delicious beverage, non-alcoholic and perfectly pure; guaranteed to be prepared from fresh and specially selected Fruit only.

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ONLY PRIZE MEDAL,



LONDON, 1881.

RAISED BY THE
PERSISTENT ENERGY
AND GREAT CARE
OF CHEMISTS

Year	No. of Members	Dividend
1878	119	None
1879	350	None
1880	430	None
1881	540	None
1882	615	3½
1883	708	5

TELEGRAPHIC

Chemists Starbeck Harrogate



HIGHEST PRIZE MEDAL



BRADFORD, 1882.

Telegraphic
Address
"RUBINE
LONDON."

STRENGTHENED AND
SUPPORTED BY THE
APPROBATION OF THE
MEDICAL PROFESSION

Year	No. of Members	Dividend
1884	903	6
1885	1,193	6
1886	1,463	6
1887	1,612	7½
1888	1,892	5
1889	2,031	7½

ADDRESSES

Chemists Sun Factory Bristol.

INCREASE OF SALES.—The Sales for the Half-year ending March 31, 1890, show an increase of 30 per cent. over the corresponding period of previous year.

This Company manufactures the various descriptions of Mineral Waters of the highest class and of specified formula, and now numbers over 2,000 Members. Good Dividends.

PRICES.

	In Corked Bots.	In Syphons.		In Corked Bots.	In Syphons.
Carbonated Water	1/-	1/6	Lime Juice	1/-	2/6
Soda 5 Grains to Half-Pint	1/-	1/6	Ginger Ale	1/-	2/6
Soda B.P. 15	1/-	1/6	Ginger Beer, Glass	1/-	2/6
Potash 6	1/-	1/6	Lithia, B.P., 5 grains to Half-pint	1/6	2/6
Potash B.P. 15	1/-	1/6	Iron and Quinine Water	1/6	—
Beltzer	1/-	1/6	Mineral Acid	1/6	—
Lemonade	1/-	2/6			

Syphons, 24s. per dozen.

Cases—3 dozen 3s. 6d.; 4 dozen 4s. 6d.; 6 dozen 5s. 6d. each.

Empties allowed for at same prices.

3d. per dozen charged extra for the delivery of Syphons in London.

SYRUPS.

In 26-oz. bottles, handsomely labelled and capsuled. Raspberry, Strawberry, Cherry, Red Currant, Black Currant, Pine Apple, &c., 8/- per dozen. Lime Fruit Cordial, 8/- per dozen. Bottles charged 1/- per dozen, and allowed for on return.

A holder (Chemist) of £1 share is entitled to all the advantages of this Association.

SAMPLE CASE OF WATERS SENT FREE.

Handbills with Name and Prices supplied gratis to Shareholders.

The Chemists' Aerated and Mineral Waters Association, Limited,
LONDON, HARROGATE, & BRISTOL.

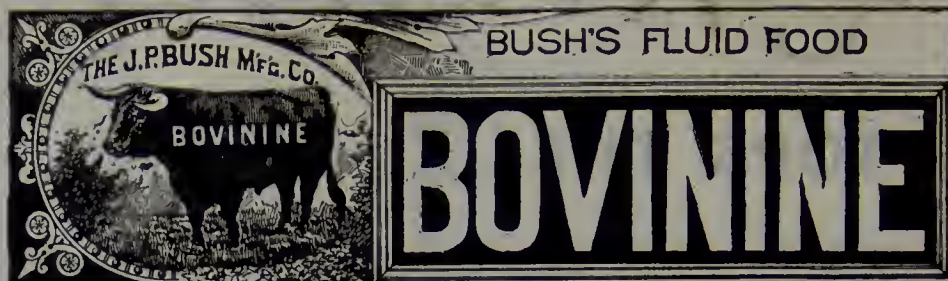
THE FIRST RAW FOOD EXTRACT.

(Introduced to the Medical Profession in 1878.)

AN IDEAL FOOD.

PALATABLE.

KEEPS
PERFECTLY.



CONTAINING
20 PER CENT
OF
COAGULABLE
ALBUMEN.

THE VITAL PRINCIPLES OF BEEF CONCENTRATED.

BOVININE consists of the juices of lean raw beef obtained by a mechanical process, neither heat nor acid being used in its preparation. The nutritious elements of lean raw beef are thus presented in a concentrated solution, no disintegration or destruction of the albumen having taken place. The proteids in solution amount to twenty per cent. of the weight of the preparation, and give to it the great dietetic value it possesses in all conditions where a concentrated and readily assimilable food is needed.

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ALBUMINOIDS IN MEAT ESSENCES

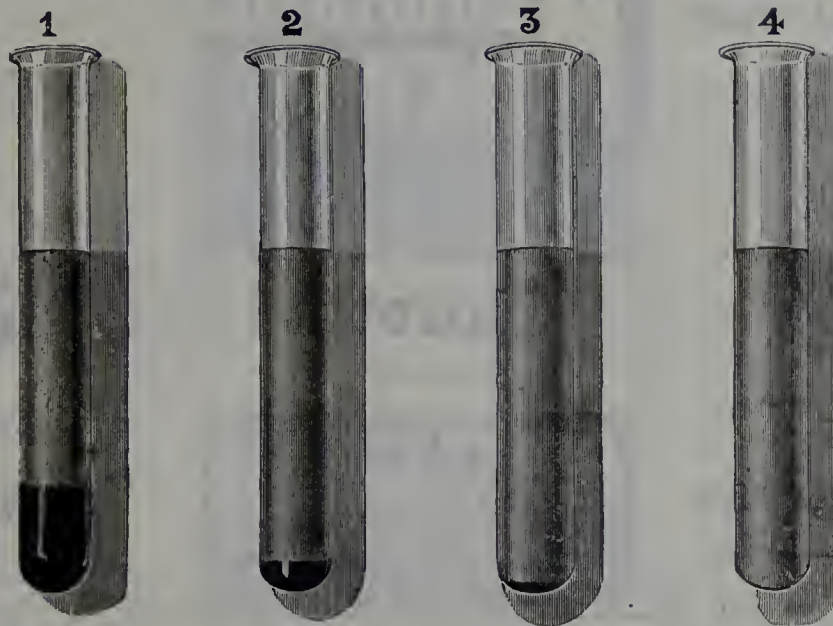
By V. H. WYATT WINGRAVE, M.R.C.S.Eng., L.S.A.Lond., Lecturer on Physiology at Cooke's School of Anatomy & Physiology.

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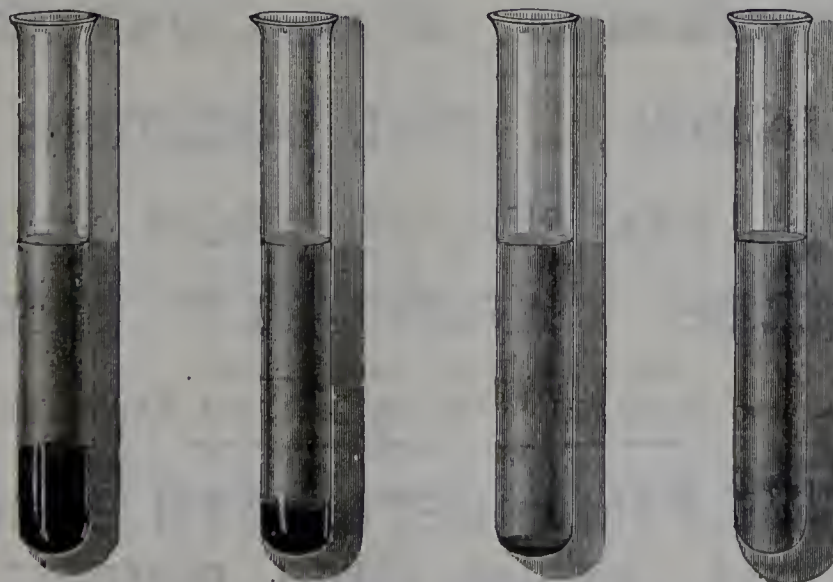
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LONDON]

SEPTEMBER 6.

[1890

Reports upon The Best Extract of Malt.

THE LANCET.

The *Lancet*, after due inquiry and investigation, reported upon the Kepler Extract of Malt as follows:—"It is the best known and, in this country, the largest used Extract of Malt. It is as distinct an advance in therapeutics as was the introduction of cod-liver oil. It is one of our best nutritive and digestive agents for chronic dyspepsia, and is undoubtedly useful in consumption and other wasting diseases."

In the above dictum we find the gist of the whole matter in a nut-shell, and very naturally it may be asked—what is this Extract which the *Lancet* pronounces the best known and largest used? What is this product that is as distinct a step forward as the discovery of Cod-liver Oil? What is the nature of this nutritive and digestive agent, undoubtedly useful in wasting diseases? The answer is simply—it is an improved, refined, condensed, highly nutritious and easily assimilable food that has been used for untold ages. It is an advance upon the "ptisan" of antiquity, quite as great and substantial as the improvement "Tabloids" is upon primeval modes of medication. It is an Extract of the choicest Barley Malt, which has been made by straining an infusion of the best malted barley, evaporating the liquid *in vacuo* and condensing it by very special and improved methods. So great a food is barley that some have endowed it with the dignity of medicinal properties. Well may the *Lancet* pronounce it "as distinct an advance in therapeutics as was the introduction of Cod-liver Oil." The great Liebig considered malted barley the greatest discovery in the matter of infant feeding.

THE LONDON MEDICAL RECORD.

The *London Medical Record* says:—"The Kepler Extract is the best, richest in diastase, and the most largely used. We have witnessed the processes, have tested it, and are satisfied that it is not only unsurpassed, but unequalled. It is the Extract of Malt which every physician now prescribes."

It will be observed that in this quotation the verdict is the same as in that from the *Lancet*, viz., that "Kepler's is the best." But it is further pointed out that it is the richest in diastase. Now, of all the grains barley is pre-eminently the one rich in diastatic ferments. Before this one grain, diastatically, all other grains are merely chaff, and in making a combination of them the barley's diastase is ordinarily relied on to do the work. As is well known,

the action of malt diastase is the same as that of the saliva and of the pancreatic juice, viz., to convert starch into sugar. When the food is bolted, the saliva has no time for action, indigestion ensues, and it is in such cases that the Kepler Extract has been found useful, for "it is not only unsurpassed, but unequalled."

The *London Medical Recorder* confirms the quotation already transcribed, as follows:—"The Kepler Extract of Malt speedily improves the power of assimilation, and in cases of consumption, scrofula, and many of the wasting diseases of children, a wonderful improvement in the patient's condition may be noticed after a fortnight's treatment." We have here a typical example of how physician after physician has reported upon this product. No more trying chronic ailments are daily encountered than consumption, scrofula, and the wasting diseases of children. When cod-liver oil has failed, and the food is disagreeing, and medication proves worse than useless, the Kepler Extract affords a recourse sure and steadfast—one which gives promise of an improved condition after a fortnight's treatment. It improves the digestion, and upon this follows improved assimilation and nutrition, both of which give rise to a better appetite: this in turn again carries the improvement onward.

MEDICAL TIMES AND GAZETTE.

The *Medical Times and Gazette* reports as follows:—"The Kepler Extract of Malt is deserving of special commendation. It is, we venture to say, by far the best we have seen, the one most widely known and most largely used. By their new process, which includes evaporation at an unusually low temperature, all of the diastase is fully preserved, and the Kepler Extract of Malt will be found unequalled in its power of digesting starchy or farinaceous foods." Why is the Kepler Extract of Malt deserving of special commendation? First of all, because it is made from the choicest barley only. Second, because barley contains more choice ingredients obtainable by malting than any other grain. Third, because no grain malts like barley. Fourth, because the Kepler Extract is prepared at every stage by the most improved and scientific processes. Fifth, because nothing is wasted, and all the digestive, nutritive, and alterative principles of the grain are secured. Sixth, because nothing insoluble and indigestible is retained. Seventh, because in taste it is as delicious as honey. Eighth, because in the system none of it is lost, and it is all easily absorbed.

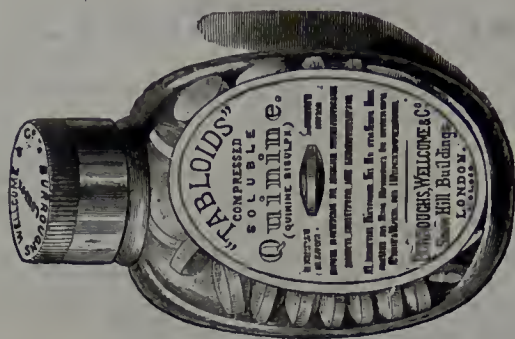
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FRENCH PHARMACEUTICAL NEWS.

(From our Paris Correspondent)

A DEFAULTING PHARMACIST.—The Mutual Benevolent Association of the "Pharmaciens de l'Est" has come near being wrecked by the treasurer's defalcations. According to a report presented by President Ferrand at the last annual meeting held at Lyons, a considerable deficit was, last April, discovered in Treasurer Favrichon's accounts. All the cash was gone, the negotiable bonds and securities had disappeared, and debts were pending to an unknown amount. The total apparent deficit was 5,622f. out of 8,764f. But since then some of the securities, on which the Bank of France had loaned 80 per cent. of the face value, were recovered, or rather the 20 per cent. left of their worth, and a dividend was secured from the bankrupt estate. The late treasurer being hopelessly insane, no further legal steps could be taken against him, and his family turned a deaf ear to all entreaties. So, after liquidating all accounts, some 2,750f. were saved from the wreck, which, added to 30 shares of the Pharmacie Centrale (untransferable), will constitute a small working fund of some 225l., enabling the society to bold together and recuperate. It is but fair to add that the unfortunate Favrichon was hardly responsible for his acts when he began his peculations.

GERMAN PHARMACEUTICAL NEWS.

(From our Berlin Correspondent.)

THE GERMAN APOTHEKER VEREIN.—This society met, as previously announced, in Rostock, under the presidency of Dr. Brunnengraeber. The attendance was somewhat poor; only a little over a hundred attended, and these were chiefly chemists from the extreme north of Germany. The greater part of the proceedings concerned the society's rules of association, &c., and was quite uninteresting to all but the members. There was, however, one resolution of considerable interest, to the effect that the Reichstag should be petitioned to sanction the employment of duty-free spirit for the manufacture of medicinal preparations. Dr. Witte, who is a member of the Reichstag, promised to use his influence to secure the desired concession. A paper was also read by Dr. Fritsch on the chemical relation between the new synthetical remedies, and another by Mr. Siebert, of Marburg, which dealt with educational questions. It is perhaps of interest that the income of the Verein in 1889 was 40,402m., and the expenses 36,113m., while the capital amounts to 66,874m.

THE ALKALOIDS OF BELLADONNA.—Three papers were read by Professor Schmidt, of Marburg, who had investigated the roots of *Atropa belladonna* and a few other members of the Solanaceæ. His examination had been specially directed to the average amount of alkaloid contained in the roots under various conditions, and the results may be expressed as under:—

Taken in	Old Roots	Young Roots
	Per cent.	Per cent.
Spring	0.174	0.127
Summer	0.358	0.452
Autumn	0.280	0.458

With reference to the composition of this total alkaloid, he found that the young roots contained only hyoscyamine, and the old roots much hyoscyamine and a little atropine, no difference being observed between roots collected in spring, summer, or autumn. In the seeds of datura he found that the so-called daturine consisted of hyoscyamine and small quantities of atropine and hyoscyne. He also analysed in a similar way the leaves of *Duboisia*; one sample contained chiefly hyoscyamine, and another only hyoscyne. Traces of mydriatic alkaloids were also discovered in the potato herb, and in *Solanum nigrum*, in *Lycium barbarum*, and in *Nicotiana tabacum*.

The British Association for the Advancement of Science.

LEEDS, 1890.

ABSTRACT OF THE ADDRESS BY SIR FREDERICK AUGUSTUS ABEL, C.B., D.C.L. (OXON.), D.Sc. (CANT.), F.R.S., P.P.C.S., HON.M.INST.C.E., PRESIDENT.

THE President commenced his address with an allusion to the meeting of the Association in Leeds thirty-two years ago, under the presidency of Professor Richard Owen. Very few of those who held prominent positions at that meeting had survived. Whewell, Herschel, Hopkins, the elder Brodie, Murchison, William Fairbairn, and Sir Edward Baines, all Presidents of Sections in 1858, have all been removed. The illustrious President himself, however, still intellectually bright at the ripe age of eighty-six, is happily still preserved to us.

This good town of Leeds, whose cloth-market was described by Daniel Defoe, one hundred and sixty odd years ago, as "a prodigy of its kind, and not to be equalled in the world," can boast of a goodly array, upon the scroll of its past history, of names of men eminent in the Sciences, the Arts and Manufactures, in Divinity and Letters, and in heroic achievements. Lord Fairfax, one of the most prominent heroes of the Commonwealth; Smeaton, the engineer; William Hirst and John Marshall, illustrious examples of the men who by their genius, energy, and perseverance placed Great Britain upon the pinnacle of industrial and commercial greatness which she so long occupied unassailed; Richard Bentley, the eminent classic and divine; John Nicholson, the Airedale poet; John Fowler and Peter Fairbairn, worthy followers in the footsteps of Smeaton; Isaac Milner, weaver and mathematician, afterwards Senior Wrangler and Vice-Chancellor of Cambridge University; Thoresby, antiquarian and topographer; Benjamin Wilson, painter, and industrious contributor to the development of electrical science; William Hey, the eminent surgeon; Sadler, political economist and philanthropist; the brothers Sheepshanks—Richard, the astronomer, and John, the accomplished patron of the arts; Edward Baines, whose conspicuous talents and energy developed a small provincial journal into one of the most powerful public organs of the country; and especially Joseph Priestley, born within six miles of Leeds, were referred to. This latter, by brilliant powers of experimental investigation, rapidly achieved a series of discoveries which helped largely to dispel the shroud of mystery surrounding the art of alchemy, and to lay the foundation of true chemical science. The publication, in 1767, of his valuable work on "The History and Present State of Electricity, with Original Experiments," secured him a prominent position among the working Fellows of the Royal Society. His first publication in pneumatic chemistry, on "Impregnating Water with Fixed Air" (carbonic acid), attracted great attention; it was at once translated into French, and the College of Physicians addressed the Lords of the Treasury thereon, pointing out the advantages which might result from the employment, by men at sea, of water impregnated with carbonic acid gas, as a protective against, or cure for, scurvy.

Six years later Priestley investigated the chemical effects produced on the air by the burning of candles and the respiration of animals, and, having demonstrated that it was

thereby diminished in volume and deteriorated, he showed that living plants possessed the power of rendering air, which had been thus deteriorated, once more capable of supporting the combustion of a candle. At about this time Priestley received very advantageous proposals to accompany Captain Cook upon his second expedition to the South Seas; but when about to prepare for his departure he learned from Sir Joseph Banks that objections against his appointment, on account of the great latitude of his religious principles, had been successfully urged by some ecclesiastic member of the Board of Longitude. In 1773 the Royal Society awarded Priestley the Copley Medal for a remarkable paper entitled "Observations on Different Kinds of Air," and in that year he became librarian and literary companion to the Earl of Shelbourne (afterwards Marquis of Lansdowne), and thereby secured special advantages in the pursuit of his scientific researches.

After investigating the properties of nitric oxide, and applying it to the analysis of air, Priestley, in 1774, discovered and carefully studied oxygen, which he obtained by the action of heat upon the red oxide of mercury. He was the first to prepare and study sulphurous acid, carbonic oxide, nitrous oxide, hydrochloric acid (*marine acid air*), and the fluoride of silicon, and carried out important researches on the properties of hydrogen, and other gases previously but little known.

Turning now to the subjects on which he is an authority, Sir Frederick Abel dealt first with

ELECTRIC SCIENCE.

He reminded his audience that the year 1858, when the Association last met at Leeds, witnessed the accomplishment of the first great step towards the establishment of electrical communication between Europe and America, by the laying of a telegraph-cable connecting Newfoundland with Valencia. Through this cable a message of thirty-one words was shortly afterwards transmitted in thirty-five minutes, an achievement which, though exciting great enthusiasm at the time, scarcely afforded promise of the succession of triumphs of ocean telegraphy which have since surpassed the wildest dreams of the pioneers in the realms of applied electricity. Tracing briefly the development of the electric telegraph, he said the first needle-instrument of Cooke and Wheatstone transmitted messages at the rate of four words per minute, requiring five wires for that purpose;

six messages are now conveyed by one single wire, at ten times that speed, and news is despatched at the rate of 600 words per minute. Duplex working, which more than doubled the transmitting power of a submarine cable, was soon eclipsed by the application of Edison's quadruplex working, which has in its turn been surpassed by the multiplex system, whereby six messages may be sent independently, in either direction, on one wire. When last the British Association met in Leeds submarine telegraphy had but just started into existence; thirty years later the accomplished President of the Mechanical Section informed us, at our meeting at Bath, that 110,000 miles of cable had been laid by British ships, and that a fleet of nearly forty ships was occupied in various oceans in maintaining existing cables and laying new ones.

The late Sir William Siemens, in his presidential address at Southampton, in 1882, referred to the passing of the first Electric Lighting Bill, in the year of his presidency, as being designed to facilitate the establishment of electric installations in towns. That measure assigned such power to local authority that the utilisation of electric lighting was delayed for a time. This delay, however, has afforded time for the further development of practical details, and subsequent legislation, together with the practical realisation



SIR FREDERICK ABEL, C.B.

of comparatively economical methods of distribution, and the apportionment, so far as the metropolis is concerned, of distinct areas of operation to different competing companies, have combined to place electric lighting in this country at length upon some approach to a really sound footing, and to give the required impetus to its extensive development. Nine companies either are now, or will very shortly be, actually at work supplying, from central stations, districts of London comprising almost the entire western and north-western portions of the metropolis. In other parts of England there are already twenty-seven lighting stations actually at work in different towns, besides others in course of establishment, and many more projected. Yet our recent progress in this direction, encouraging though it has been, is insignificant as compared with the strides made in the application of electric lighting in the United States, as may be gauged by the fact that, while in America the number of arc lamps in use, in April of this year, was 235,000, and of glow-lamps about three millions, there are at present about one-tenth the number of the latter, and one-hundredth the number of arc lamps, in operation in England.

The electrical illumination of passenger-ships and war-ships, of lighthouses, of main roads in coal-mines, and even for signalling purposes in mid-air through the agency of captive balloons, were referred to as affording fresh demonstrations of the value of this particular branch of applied electric science. The recent completion of the Board of Trade standardising laboratory, established for the purposes of arriving at and maintaining the true values of electrical units, and of securing accuracy and uniformity in the manufacture of instruments supplied by the trade for electrical measurements, is an official recognition of the firm root which the domestic and industrial utilisation of electric energy has taken in this country.

The telephone was first exhibited as a practically workable apparatus to members of the British Association at the Plymouth meeting in 1877, and the number of instruments now at work throughout the world may be estimated as considerably exceeding a million.

The progress of the applications of electric energy to traction purposes was also noticed, and it was stated that the idea cherished by Siemens, and enlarged upon by him in more than one interesting address, of utilising the power of Niagara, appears about to be realised, at any rate in part, as a large tract of land has been recently acquired, by a powerful American association, about a mile distant from the Falls, with a view to the erection of mills for utilising the power, which it is also proposed to transmit to distant towns; and an International Commission, with Sir William Thomson at its head, will carefully consider the problems involved in the execution of this grand scheme.

METALLURGY.

Tracing the labours of Joule, Thomson, and others in regard to the application of electric currents to the welding of iron and steel, and to analogous operations, Sir F. Abel referred to the production of aluminium alloys in electric furnaces, at Lockport, N.Y., and at similar works in North Staffordshire. The electric process of producing aluminium-alloys has, however, to compete commercially with their manufacture by adding to metals, or alloys, pure aluminium produced by processes based upon the method originally indicated by Oersted in 1824, successfully carried out by Wöhler three years later, and developed into a practical process by H. St. Claire Deville in 1854—namely, by eliminating aluminium from the double chloride of sodium and aluminium in the presence of a fluoride, through the agency of sodium. An analogous process, indicated in the first instance by H. Rose—namely, the corresponding action of sodium upon the mineral cryolite, a double fluoride of aluminium and sodium—has also been recently developed at Newcastle, where the first of these methods was applied, upon a somewhat considerable scale, in 1860, by Sir Lowthian Bell, but did not then become a commercial success, mainly owing to the costliness of the requisite sodium. As the cost of this metal chiefly determines the price of the aluminium, technical chemists have devoted their best energies to the perfection and simplification of methods for its production, and the success which has culminated in the admirable Castner process constitutes one of the most interesting of recent illustrations of the progress

made in technical chemistry, consequent upon the happy blending of chemical with mechanical science, through the labours of the chemical engineer.

Those who remember how, between forty and fifty years ago, a few grains of sodium and potassium were treasured up by the chemist, and used with parsimonious care in an occasional lecture-experiment, cannot tire of fastening their eyes on the stores of sodium-ingots to be seen at Oldbury as the results of a rapidly and dexterously executed series of chemical and mechanical operations.

The President then dealt at some length with numerous investigations and discoveries in regard to the alloys of aluminium, chromium, manganese, tungsten, copper, and nickel, with iron and with steel, with especial reference to the influence which they respectively exercise upon the salient physical properties of those materials, even when present in them in only very small proportions, and urged the importance of a more searching or complete application of chemical analysis than hitherto practised to the determination of the composition of the varieties of steel which practical experience has shown to be peculiarly adapted to particular uses. It appears, indeed, not improbable that certain properties of these, which have been ascribed to slight variations in the proportion or the condition of the constituent carbon, or in the amounts of silicium, phosphorus, and manganese which they contain, may sometimes have been due to the presence in minute quantities of one or other of such metals as those named, and to the effects which they produce, either directly or indirectly, by modifying or counteracting the effects of the normal constituents of steel. The important part now played by manganese in steel manufacture is an illustration of the comparatively recent results of research, and of practical work based on research, in these directions, and the effects of the presence in steel of only very small quantities of some of the other metals named are already being similarly understood and utilised.

Roberts-Austen has suggested that the modifications effected in the physical characteristics of metals by alloying these with small proportions of other metals, may have direct connection with the periodic law of Mendeleeff, which may furnish explanations of the causes of specific variations in the properties of iron and steel; and this idea has been followed up energetically by Osmond, who regards his results as being quite confirmatory of the soundness of Roberts-Austen's suggestion, as they demonstrate that foreign elements having atomic volumes lower than iron tend to make it assume or preserve the particular molecular form in which it has itself the lowest atomic volume, while the converse is the case for the foreign elements of high atomic volume.

EXPLOSIVES.

Turning next to the subject with which his work has been especially connected, and comparing it with sanitary science, Sir F. Abel asked, What shall we say of the benefits which sailors and soldiers, in the pursuit of their calling, derive from the ceaseless costly competition amongst nations for supremacy in the possession of formidable artillery, violent explosives, quick-firing arms of deadly accuracy, and fearful engines which, unseen, can work wholesale destruction in a fleet? And what can we say of the benefits acquired by individual countries in return for their continuous, and sometimes ruinous, expenditure in endeavouring to maintain themselves upon an equality with their neighbours in man-killing power? The conditions under which engagements by sea or land will in the future be fought have certainly become greatly modified from those of thirty-five years ago, and the duration of warfare, even between nations in conflict who are on a fair equality of resources, must become reduced; but, as regards the results of a trial of strength between contending forces, similarly equipped, as they now will be, with the latest of modern appliances, only varying in detail, these must, after all, depend, as of old, partly upon accident, favoured, perhaps, by a temporary superiority in equipment, partly upon the skill and military genius of individuals, and very much upon the characteristics of the men who fight the battles.

It might be said in favour of the advances made in the appliances of war, that by continuous competition in the development of their magnitude, diversity, and perfection,

the resources of the manufacturer, the chemist, the engineer, the electrician, are taxed to the uttermost, with the very important, although incidental, results, that industries are created or expanded and perfected, trades maintained and developed, and new achievements accomplished in applied science, which in time beneficially affect the advance of peaceful arts and manufactures. In these ways the expenditure of a large proportion of a country's resources upon material which is destroyed in creating destruction does substantially benefit communities, and tends to the accomplishment of such material progress by a country as goes far to compensate its people for the sacrifices which they are called upon to incur for the maintenance of their dignity among nations.

The President proposed, therefore, to say "something of recent advances in one of the several branches of science in its applications to naval and military requirements with which, during a long and arduous official career, now approaching its close," he had become in some measure identified.

First dealing with the numerous forms of gunpowder which had been experimented with, and in some cases adopted recently, the President came to the interesting subject of

SMOKELESS POWDER.

On modern ships, after a very few rounds rapidly fired, with black powder, the objects, against which it is desired to direct the fire are more or less completely hidden by the interposed smoke. Military authorities also recognised the importance of dispensing with smoke in engagements on land. Hence arose the demand.

Ammonium nitrate, of which the products of decomposition by heat are, in addition to water-vapour, entirely gaseous, was a tempting material; but its deliquescent character has been a formidable obstacle to its application as a component of a useful explosive agent. By incorporating charcoal and saltpetre in particular proportions with ammonium-nitrate, F. Gaus recently claimed to have produced an explosive material free from the hygroscopic character common to other ammonium-nitrate mixtures, and furnishing only permanently gaseous and volatile, or smokeless, products of explosion. These anticipations were not realised, but they led the talented German powder-maker, Mr. Heidemann, to produce an ammonium-nitrate powder possessing remarkable ballistic properties, and producing comparatively little smoke, which speedily disperses. But it rapidly absorbs water when the hygroscopic condition of the air approaches saturation, and this greatly restricts its use.

About five years ago a French smokeless powder was much talked of. The secret of its composition was well preserved by the authorities; it is now known, however, that more than one smokeless explosive has succeeded the original, and that the material at present in use with the Lebel repeating rifle belongs to a class of nitro-cellulose or nitro-cotton preparations.

So far as smokelessness is concerned, no material can surpass *gun-cotton* (or other varieties of nitro-cellulose); but the difficulty of regulating its explosive force, when confined as in the bore of a gun, has proved insuperable, as some slight unforeseen variation in its compactness, or in the amount and disposition of the air-spaces in the mass, develops very violent action. He had himself obtained promising results by reducing the fibre to a pulp, and converting this into highly-compressed, homogeneous masses of the desired form and size. But the uniform fulfilment of the conditions essential to safety proved to be beyond absolute control, even in guns of small calibre; and military authorities not being, in those days, alive to the advantages which might accrue from the employment of an entirely smokeless explosive in artillery, experiments in this direction were not persevered in.

Colonel Schultze's smokeless sporting-powder, produced from finely-divided wood, converted after purification into a mildly explosive form of nitro-cellulose, and impregnated with a small portion of an oxidising agent, closely resembles the well-known E.C. sporting powder, which consists of a nitro-cotton reduced to pulp, incorporated with nitrates of potassium and barium, and converted into grains through the agency of a solvent and a binding material. Both these

powders produce very little smoke compared with black powder, but do not compete with the latter in regard to accuracy of shooting, when used in military arms.

Camphor and liquid solvents have been applied to the hardening of the surfaces of granulated or compressed masses of gun-cotton and of this class of its preparations, with a view to render them non-porons. In some smokeless powders of French, German, Belgian, and English manufacture, acetic ether and acetone have been also used, not merely to harden the granules or tablets of the explosive, but to convert the nitro-cellulose, in the first instance, into a more or less gelatinous condition, so that it can readily be incorporated with other components and rolled, or spread into sheets, or pressed into moulds, or squirted into wires, rods, or tubes, while still in a plastic state. When the solvent has afterwards been removed, the hardened, horn-like, or somewhat plastic product is cut up into tablets, or into strips or pieces of suitable dimensions, for conversion into charges or cartridges.

Another class of smokeless powder, similar in physical characteristics to these nitro-cellulose powders, but containing nitro-glycerine as an important component, has been originated by Mr. Alfred Nobel, the inventor of dynamite. This was almost perfectly smokeless, and developed very high energy, accompanied by moderate pressures at the seat of the charge, but it possessed certain practical defects, which led to the development of several modifications. The relative merits of this class of smokeless powder, and of various kinds of nitro-cellulose powder, are now under careful investigation in this and other countries; the difficulties to be overcome arise in part from the comparatively great heat they develop, which increases the erosive effects of the products of explosion, and in part from the more or less complete absence of solid products.

The wonderful press reports of what had been accomplished in France, indicating that not only smoke but also, to a great extent, noise would be abolished in future battles, Sir F. Abel says, were mythical, and could only be ascribable to a phenomenal combination of credulity with ignorance of the most elementary scientific knowledge.

But a smokeless, or nearly smokeless, powder has been adopted in Germany, of which the almost transparent film of smoke produced by independent rifle-firing is not visible at a distance of about 300 yards; at shorter distances it presents the appearance of a puff from a cigar. The most rapid salvo-firing by a large number of men does not have the effect of obscuring them from distant observers. When machine-guns and field-artillery are fired with the almost absolutely smokeless powder which we are employing, their position is not readily revealed to distant observers by the momentary vivid flash of flame and slight cloud of dust produced, so that there now appears little doubt that in future warfare the screening or obscuring effect of smoke will be practically absent during engagements.

The secret of the precise nature of Mélinite has been extremely well preserved, and its composition is not yet exactly known, except to the French authorities. It is asserted to be a mixture of picric acid with some material imparting to it greater power; but accounts of accidents which have occurred, even quite recently, in the handling of shells charged with that material appear to show that, in point of safety or stability, it is decidedly inferior to simple picric acid. Reliable as the latter is, in this respect, its employment is, however, not unattended with the difficulties and risks which have to be encountered in the use, in shells, of other especially violent explosives.

With regard to submarine mines and locomotive torpedoes, such as those marvels of ingenuity and constructive skill, the Whitehead and Brennan torpedoes, the important progress recently made in the practical development of explosive agents has not resulted in the provision of a material which equals wet compressed gun-cotton in combining with great destructive power the all-important essential of safety to those who have to deal with these formidable weapons, and to man the small vessels which have to perform the very hazardous service of attacking ships of war.

The prevention of accidents in mines, and of accidents from petroleum-lamps, and the establishment of the Imperial Institute, all subjects on which Sir Frederick Abel has worked prominently, were the remaining topics of his very important, but lengthy, address.

British Pharmaceutical Conference.

TWENTY-SEVENTH ANNUAL MEETING.

LEEDS, SEPTEMBER 2 AND 3, 1890.

MR. CHARLES UMNEY, F.I.C., F.C.S., PRESIDENT.

RECEPTION AND CONVERSAZIONE.

OFFICIALLY the British Pharmaceutical Conference is opened on the Tuesday morning. But the state inauguration is now celebrated on the Monday evening. The Leeds Committee had provided handsomely for this function. The rooms of the Philosophical Hall, in Park Row, admirably

tations by Mr. Ernest Denny, attracted a large audience in the theatre, where, subsequently, Messrs. F. W. Branson and W. Clement Williams exhibited some beautiful lantern views of Leeds and its neighbourhood. The pictures of Wharfedale and Bolton Abbey excited the hopes of the trippists of the following Thursday, but it was scarcely a compliment to the authors of the papers to interpose between Leeds and



adapted for the purpose, were gaily decorated, and were thronged with ladies and gentlemen from 8 to 10 p.m. Mr. Umney received the visitors with the cordiality which has been one of the minor attributes of his popularity as a President, and entertainments overlapped each other. A musical entertainment, interspersed with some clever reci-

these views "the valley of desolation." Upstairs was a very fine collection of more than fifty microscopes with highly interesting exhibits, the pharmacists of Leeds (including Messrs. Reynolds, Bowman, Yewdall, Jefferson, and Kirkby) figuring very well among the exhibitors. There was an interesting collection of volumes in

the library. Mr. Bendlock Hewctson lent a remarkable exhibition of agates, and Mr. Benjamin Holgate a series of fossils illustrating the six geological sections in the borough of Leeds, while Mr. R. Reynolds sent a quaintly valuable collection of old blue doctors' pots and vases. Professor Stroud, D.Sc., and Mr. W. S. Hannam gave an exhibit of Crooke's and Geissler's tubes and other scientific apparatus, and in the refreshment department there were, we were informed by a connoisseur, no fewer than "thirty different kinds of cakes." An artistically and appropriately designed programme of the entertainment, reproduced from a sketch by Mrs. Fred Reynolds, was valued by the guests and retained as a souvenir. Our artist has scarcely sufficiently realised the general elegance of the ladies in the specimens caught, but the famous pharmacists who happened to be grouped near the staircase while the pencilling was proceeding may rest assured that no trouble or expense has been spared to present them to an admiring world in their best-looking aspects.

PROCEEDINGS OF THE CONFERENCE.

Tuesday, September 2, 1890.

At ten o'clock on Tuesday morning the spacious hall of the Philosophical Institute had a deserted appearance, but ten minutes thereafter members, some of whom were accompanied by ladies, began to troop in, and by 10.20 enough were present to warrant a beginning of the proceedings. Beside Mr. Umney on the platform were Messrs. Richard Reynolds, Atkins, Benger, and Schacht, past-presidents; Mr. Martindale, hon. treasurer; Mr. Alex. Bottle, vice-president of the Pharmaceutical Society; and Messrs. W. A. H. Naylor and F. Ransom, hon. secretaries. Things did not look particularly cheerful when Mr. Richard Reynolds rose to give the Conference a

WELCOME.

Speaking on behalf of the local committee, Mr. REYNOLDS said: It is somewhat unfortunate that this duty should fall upon a person who has been connected with the Conference so intimately as I have. You know the very garrulous character that is given, justly or unjustly, to old nurses of the family, and, having known you since the Society you represent came into existence, I should be inclined, perhaps, to occupy too much time by speaking of the past. The past, at any rate, has been a secure foundation for the present. That should satisfy us, too; and if we can hand down to the future what we have received from those who went before us, I trust we shall have performed our part in our day and



PHILOSOPHICAL HALL.

generation. (Cheers.) The fact that one has known your Society since the question arose of what name you should bear is going to a very early stage. I think I may almost say that the wedding-cards of your parents were printed in Leeds, though they have got to look very old and yellow, as such things will do. The birthplace of the Conference has already been visited in Newcastle; and of course last year was a notable epoch in our meetings. I might give many interesting incidents in your childhood—how discreetly you behaved; how, when there

was once a risk that you would be spoiled by too many good things, you said, "Please do not give me too many sweets; they are not good for me." We saw quite recently the notice of a book by Mr. Oscar Wilde. He wrote his own book, and he wrote his own review, so as to be sure that it was a suitable record. It was very brief; it was "poisonous, but perfect." Now there is a risk sometimes that the entertainment of a society may not be quite wholesome, but with the wisdom which marked your early years you still ask, "Please leave me to work—do not spoil me by too many sweets"; and I hope that you are all the healthier and your digestion is the better in consequence of it. I will only say that your trips to various parts of the country have certainly broadened your minds; you have gone to health resorts, such as Bath and Brighton, the places where we generally go to look for renewed health. You have been over the country very thoroughly now, and, on behalf of Leeds, and reminding you that Yorkshire has had the honour of receiving the Conference three times already, and that that is the reason we have had to defer the pleasure, I offer you on behalf of the local committee the heartiest Yorkshire welcome that we know how to give. (Loud cheers.)

The PRESIDENT said the first business was the

RECEPTION OF DELEGATES

from the Pharmaceutical Society and other societies in the kingdom, and also from the colonies and elsewhere, if they were fortunate in having such members present. He called upon Mr. Ransom to read the list of names, and this was done in the usual formal manner, the following being the list, but it must not be assumed that all were present:—

Pharmaceutical Society of Great Britain.—The President, Vice-President, Treasurer, Messrs. Abraham, Allen, Atkins, Cross, Leigh, Martin, Martindale, Newsholme, and Schacht; (North British Branch) Messrs. D. Frazer, A. Kinninmont, and J. Paterson.

Pharmaceutical Society of Ireland.—Messrs. G. D. Beggs and F. W. Wells, jun.

Aberdeen and North of Scotland Society of Chemists and Druggists.—Messrs. J. Johnston and J. G. Kay.

Brighton Association of Pharmacy.—Messrs. Marshall Leigh and W. D. Savage.

Bristol Pharmaceutical Association.—Messrs. Schacht and Towerzey.

Dover Chemists' Association.—Messrs. Alex. Bottle and W. Wyles.

Hawick Pharmaceutical Association.—Mr. Thomas Maben.

Hull Chemists' Association.—Messrs. C. B. Bell, J. S. Linford, and B. M. Stoakes.

Leeds Chemists' Association.—Messrs. F. W. Branson, P. Jefferson, R. Reynolds, S. Taylor, Geo. Ward, and Edwin Yewdall.

Leicester and Leicestershire Chemists' Association.—Messrs. J. W. Clark and J. G. F. Richardson.

Liverpool Chemists' Association.—Messrs. John Bain, M. Conroy, R. Parkinson, C. Symes, and W. Willings.

London Chemists' Assistants' Association.—Messrs. T. A. Ellwood, C. H. Seccombe, A. C. Stark, C. J. Strother, and W. Lloyd Williams.

Manchester Pharmaceutical Association.—Messrs. Benger, Kirkby, and Siebold.

Midland Counties Chemists' Association.—Messrs. J. Barclay and R. A. Cripps.

North of England Pharmaceutical Association.—Messrs. T. Maltby Clagug, P. Hall, J. Harrison, N. H. Martin, and C. E. Stuart.

Sheffield Pharmaceutical and Chemical Society.—Messrs. J. H. Eardley, A. Russell Fox, C. O. Morrison, G. T. W. Newsholme, W. Ward, and R. Watts.

West London Chemical Association.—Messrs. Long and Matthews.

APOLOGIES.

The PRESIDENT said they had letters of apology from Emeritus-Professor Bentley, Professor Attfield, Mr. Holmes, Mr. Wyley (of Coventry), and other gentlemen who were unable to attend the meeting this year. They very much regretted the absence of their old friend Professor Bentley, and he was sorry that Professor Attfield was not quite equal to attending the meeting. Mr. Holmes wrote to him from Arbroath, saying he should very much like to be present,

but unfortunately he could not attend the meeting. One of their former presidents, Dr. Brady, of Newcastle, had also written, and they had a letter of apology from Mr. Clayton, Mayor of Birmingham (formerly a pupil of their good friend Mr. Reynolds), who found his duties so heavy that he could not get here.

Mr. NAYLOR read the

REPORT OF THE EXECUTIVE COMMITTEE.

Your Committee, in presenting its annual report for the year, is glad to be able to announce that the Conference maintains its prestige and is in a satisfactory and prosperous condition.

At a meeting held in November last your Committee received with deep regret the resignation by J. C. Thresh, M.B., D.Sc., of the office of Honorary General Secretary of the Conference, consequent upon his appointment as Medical Officer of Health for the Chelmsford and Maldon rural sanitary district. On behalf of the Conference your Committee placed on record its sense of the efficient services rendered by Dr. Thresh during the five years that he held office. The assistance rendered by him not only in his official capacity, but as the author of a number of valuable papers which he has read at its meetings, has materially contributed to the success of past annual gatherings, and it is hoped that his professional duties will not prevent him from making communications in the future. At the following meeting Mr. F. Ransom, F.C.S., was appointed to fill the vacancy caused by the resignation of Dr. Thresh.

Early in the present year, on the recommendation of the Formulary Committee, sanctioned by the Executive of the Conference, an addendum to the 1888 Formulary was issued. This included preparations the increasing demand for which appeared to justify the publication of directions for their manufacture, so as to secure efficient and uniform products.

At a meeting held in the spring your Committee received with painful surprise the sad intelligence of the death of Mr. Wm. Smeeton, of Leeds, a Vice-President of the Conference. Mr. Smeeton had for many years taken a deep interest in all that concerned pharmacy, and his election to office at the last annual meeting of the Conference indicated the esteem in which he was held by this Association. Mr. G. Ward, F.I.C., F.C.S., one of the auditors, was elected to fill the vacancy, and his name has been added to the list of Vice-Presidents. At the same time Mr. Yewdall, of Leeds, generously accepted an invitation to succeed to the office previously held by Mr. Ward.

In accordance with a resolution mentioned in the report of last year, a revised circular drawing attention to the objects of the Conference and inviting to membership has been freely distributed through the secretaries of local associations to which the "Year-book" is annually sent. Sufficient time has not yet elapsed to judge of the effect of this distribution, but it is hoped that it will result in a large accession of numerical strength.

It has been resolved to send a special invitation to membership to all chemists and druggists, as they shall be placed on the Register of the Pharmaceutical Society of Great Britain. Practical effect is given to this resolution as necessity arises. It is believed, however, that more may be done in obtaining new adhesions by the personal efforts of individual members than by formal appeals made through your secretaries. Copies of circulars will be gladly supplied to any members who are willing to distribute them among their pharmaceutical friends. It is gratifying to your Committee to be able to announce the application of a money grant to defray expenses in connection with a research. The amount of 5*l.* was handed over in December to Mr. R. A. Cripps to assist him in continuing his investigations on *ipccacuanha*. Mr. Cripps regrets that his work is not in a sufficiently advanced stage to justify a presentation to this meeting of the results he has obtained.

It is a subject of special interest to note the appointment by the Pharmaceutical Society at the instance of the Medical Council of a committee of pharmacists, for the purpose of assisting the Pharmacopœia Committee of the Medical Council in the preparation of an addendum to the British Pharmacopœia. The fact that pharmacists are now represented on the Committee of Compilation may justly be regarded as a matter for congratulation. There still remain,

however, and doubtless will continue to be, many preparations in frequent demand which, although not of sufficient importance for official recognition, will require the careful attention of your Formulary Committee.

The reception held last night by the President and Officers of the Conference and the *conversazione* which followed were largely attended, and proved a signal success.

In December last Mr. Louis Siebold, F.I.C., F.C.S., was re-appointed Editor of the "Year-book." The MS. of the forthcoming volume, so far as it can be completed, is now in the hands of the printers.

Mr. MARTINDALE, Treasurer of the Conference, read the

FINANCIAL STATEMENT

and the report of the position of the Bell and Hills Library Fund:—

RECEIPTS.

	£	s.	d.
1839. July 1.			
To Assets forward from last year:—Balance in hand at Bank ..	64	17	3
Cash in Secretary's hands	3	11	7
Messrs. Churchill's Account	117	8	9
1890. June 30.			
Sale of Year-book:—By publishers	18	0	0
Advertisements:—1889 Volume	109	11	8
1883 "	7	17	0
Members' Subscriptions:—Amount received from July 1, 1889, to June 30, 1890	527	1	1
Index-book:—Sale by Secretary	0	5	0
Unofficial Formulary:—Sale by Publishers	9	9	0
Liabilities on Outstanding Account:—Messrs. McCorquodale & Co.	0	8	6
Total	£858	9	10

EXPENDITURE.

	£	s.	d.
1890. June 30.			
By Expenses connected with Year-book:—Printing, Binding, Publishing, &c.	296	12	6
Postages and Distributing	39	11	7
Advertising and Publisher's Charges	32	14	2
Editor's Salary	150	0	0
Foreign Journals for Editor	5	16	6
Unofficial Formulary:—Advertising and Postage	4	1	6
Publisher's Commission	0	19	0
Sundry Expenses:—Grant to Formulary Committee	5	0	0
Expenses of Assistant Secretary at Newcastle	10	0	0
Assistant Secretary's Salary:—From July 1, 1889, to June 30, 1890	47	0	0
Rent of Office	10	0	0
Grant (for research)	5	0	0
Blue Lists:—Printing	3	10	0
Postages of	3	1	3
Revising and Editing	5	5	0
Postages	13	1	6
Printing and Stationery:—From July 1, 1889, to June 30, 1890	19	15	6
Bank Charges, as per Bank-book	0	1	1
Petty Cash	5	11	0
Liabilities of Last Year, since paid:—Messrs. McCorquodale & Co.	6	17	9
Outstanding Assets:—Messrs. Churchill's Account	107	3	0
Balance:—At Bank	83	0	8
In Secretary's hands:—For Postages	0	2	1
Petty Cash	3	15	9
Total	£858	9	10

The Bell and Hills Fund showed an income from investments of 9*l.* 13*s.* 4*d.* Books purchased from Kimpton for Newcastle cost 9*l.* 18*s.* The invested fund stood at 360*l.*, and cash at bank, 17*l.* 4*s.* 6*d.* Messrs. T. Rheeder, Newcastle-on-Tyne, and Edwin Yewdall, Leeds, auditors, had certified the correctness of the accounts.

Mr. Martindale said he might mention that the account was a satisfactory one. There was a balance of assets in hand on the total account of about 15*l.* over the balance of last year—in fact, the accounts of the Conference were in a more satisfactory condition than they had been for some years. They had only mentioned one grant made to members for experimental research. He thought that might be

increased with benefit to the Conference if members would apply for the same. It was better to utilise the amount as much as possible. There was only a liability of 8s. 6d. owing on the accounts for the end of the year, June 30, 1890. (Cheers.)

The PRESIDENT said he should be glad to hear the remarks of the auditors on this account.

Mr. YEWDALL, one of the auditors, said he had seen the vouchers in the case, and also the Government security, and they were all correct. (Cheers.)

The next item on the programme was the President's address, and when Mr. Umney rose to deliver it he was received with hearty applause. The following is the full text:—

PRESIDENT'S ADDRESS.

When at the last meeting at Newcastle you decided to place me for a second time in the presidential chair, I appreciated the compliment, and looked forward with much pleasure to the opportunity of presiding at this annual meeting amongst so many well-known and staunch supporters of the British Pharmaceutical Conference as are to be found in Leeds and the West Riding of Yorkshire.

As this Association becomes older it is less easy to find a suitable theme for the "President's Address," inasmuch as restrictions multiply, and, notwithstanding there is much in which we are necessarily interested arising out of pharmaceutical politics, still there is an unwritten, and, in my opinion, a wise, understanding that such subjects shall be eschewed in the annual address from this chair.

Some of your past presidents framed their addresses upon the scientific progress of the preceding year, and the material was ample, and the retrospect both agreeable and instructive; but the enlarged area one would now have to traverse to produce a complete summary seems to be a sufficient reason for treating such a review in the preface of the "Year-book of Pharmacy."

The time apportioned by your Executive for reading the communications that you and others are pleased year by year to bring before the Conference is much too short, consequently discussion is curtailed, and your secretaries are frequently compelled to abstract communications, which, had time permitted, might have been more fully read and discussed.

My intention is to give you a short address, so that our time may be profitably utilised; and I beg, therefore, you will, during this Conference, punctually attend each and every sitting, so that you may, by your presence, encourage those who have communications to make, and show your appreciation of pharmacological research. (Hear, hear.)

FASHION IN MEDICINE.

We hear it remarked that there is a fashion in everything; and those who do not so express themselves are at times conscious of the difficulty in finding nowadays anything uninfluenced by fashion.

It cannot be contended that medicine, striving year by year, to become a less inexact science, knows no fashion, although it might be urged that there was in medicine a licence for adopting fashions without parallel in any other profession or calling, solely due to the rapid strides of science.

The advance in medicine and surgery of late years is a matter of common knowledge and observation, and a glance at a list of modern medicaments shows that there is a material change in the substances prescribed in the present as compared with the past generation.

During the past thirty years our *materia medica* has multiplied to no inconsiderable extent, old remedies have been discarded, a legion of new drugs introduced, crystalline and resinoid principles adopted to the almost entire exclusion of the crude substances from which they are prepared, and synthetic substances often take the place of alkaloids which were novelties but a generation ago.

You would expect, if I traversed the long list of crude substances that found their place even in the last editions of the London, Edinburgh, and Dublin Pharmacopœias with the object of showing the position they now hold, to learn that very many have fallen into disuse, that others are now unofficial, and many but seldom prescribed.

Certain drugs, notwithstanding, are as much relied upon to-day as they were half a century ago; and this is not to be wondered at when we remember that the medicinal value of such crude drugs as opium, cinchona, &c.,

depends upon the presence of certain well-defined chemical principles, which we are accustomed to isolate; and upon the proportion present in the crude substance it is customary now to assess both medicinal and commercial value. It is our practice also, as you are aware, to standardise these and similar drugs to contain a definite proportion of chemical constituent, so that the physician may use these remedies with greater precision.

Other drugs the use of which still continues—such as jalap, scammony, aloes, gamboge, &c.—are not prescribed as frequently as formerly; and to some extent this has arisen from absence of uniformity in the substances themselves.

A class of drug—not a large one, it is true—of which sarsaparilla is a type, is only occasionally prescribed, but largely used by the public, notwithstanding therapeutists have written upon its medicinal worthlessness.

Medicaments used as external applications have changed



MR. CHARLES UMNEY, F.I.C., F.C.S.

President of the British Pharmaceutical Conference.

immensely, and we find lard, as a vehicular substance or as a basis for ointments, has been displaced by solid and semi-solid hydrocarbons or the more easily absorbed lanoline.

Plasters, again, which were formerly prepared both in great quantity and variety, are now but little prescribed, and we have become familiar with other oleates of powerful inorganic bases, such as oleates of zinc, mercury, bismuth, &c.

Concentrated percolates produced from some of the most potent drugs by alcohol, ether, and chloroform menstrua, either used separately or so blended that the entire active constituent of the drug may be removed, are now largely used, elegant examples of which are seen in the official liniments of aconite and belladonna and the chloroform belladonna of the non-official formulary.

Such preparations as grey powder, antimonial powder, green iodide of mercury, notwithstanding they may be used for some specific purposes still, are in less use and esteem than formerly. This is due to the want of uniformity, even when freshly prepared, or to change and decomposition on the substances being stored.

Although the legitimacy of most of the changes must be acknowledged, still we cannot shut our eyes to the fashion that prevails in discarding antiquated, although well-trying, remedies in favour of newly-introduced drugs.

This practice is not wholly approved by the medical profession, for, at the recent meeting of the British Medical Association at Birmingham, a leading London therapist protested against the rage for new drugs, and condemned the practice as fatal to the accuracy of observation and precision of treatment.

CONCENTRATED MEDICINES.

It is fashionable with some to prescribe medicines in the most concentrated form in which the ingredients are compatible, regardless of potency. While none can reasonably expect to go back to those days when each dose of medicine was consigned to the patient in a separate vial, still many can prove that the practice of prescribing concentrated medicines is not without danger to the public, arising out of an inability to measure an exact small medicinal dose. (Applause.)

In this fashion of undue concentration the pharmacist is most deeply plunged; indeed, it is difficult to be persuaded that he himself has not largely contributed in bringing it about.

Everything nowadays must be concentrated—not to such an extent that experience and knowledge of chemical substances, drugs, and menstrua would indicate might be resorted to, so that, in the process of manufacture, subsequent storing, or use, no variation from an official standard, when the preparation is diluted, would result. No, this will not do; but a concentration of two or three times over and above that which may with safety be practised is now an everyday requirement.

"Elegant pharmacy" has something to answer for, its products having been appreciated by the eye and palate of the public, without corresponding advantage to the physician in continuing his art of prescribing.

READY-MADE PHYSIC.

Then, again, the fashion of prescribing ready-made physic, which is increasing to such an extent as to be positively alarming, is a delusion and a snare to those who desire to retain their art of orthodox prescribing. (Applause.) This practice, which is increasing with leaps and bounds, has been condemned by a leading London physician of half-a-century's experience, who writes:—"There has grown up a habit of prescribing ready-made physic, of using compounds which contain a variety of drugs, each having different properties—a practice in which there is mental proclivity to regard the disease as suitable to the physic rather than to take the trouble to find a remedy that is suitable for the disease. This system is unpractical, unscientific, and least calculated to promote a knowledge of the medicinal legitimate use of medicine. In fact, the art of writing a rational prescription is in danger of being lost."

One might continue to contrast remedies and comment upon styles and fashions almost indefinitely, but the examples given will suffice to show the changes that have

been made in our time in reference to the substances comprising our materia medica.

HOUSEHOLD REMEDIES.

Reflection must convince us that medical art is deprived of much opportunity, pharmacy undermined, the public not benefited, but, on the contrary, seriously damaged, by a fashion that has of late years both prevailed and greatly increased, and which may be described as the injudicious selection by the public of medicines to be used as household remedies.

The public has always been in the habit of treating itself for minor ailments; and until late years its choice of medicines was fairly judicious, and generally amenable to the influence of the medical profession acting through the usual channels.

An unfortunate fashion is now in the ascendancy, and there is a disregard by the public for the simple, well-trying, and safe medicaments of the past generation, and a preference for medicines which are obtained under cover of a patent-medicine stamp. (Applause.)

To condemn indiscriminately, as either useless or dangerous, all medicines that reach the public through the medium of the press, quite apart from the question of the medicine stamp, would be unjust, because many substances, simple in their nature and safe in the hands of the public, are by such means brought into greater prominence, and are not inappropriate as household medicines.

While one could particularise many such, however, it is equally certain that a number could be named which are unsuited as remedies except in the hands of the medical practitioner; further, many are of such composition that they should not be sold without being placed under the restrictions which accompany the sale of substances similar in composition included in the Schedule of Poisons in the Pharmacy Act. (Applause.)

You are aware of the increased traffic in so-called "patent medicines" during the present generation, but perhaps have not realised the extent to which it has developed, and the great strides it is making annually without let or hindrance. In the year 1860, the revenue received from medicine-stamp duty was 43,000*l.*; in the year 1889, 203,000*l.*, and during the current year it is computed that 220,000*l.* and upwards will be realised.

Now, although there has been this marked increase in the sale of patent medicines during the past thirty years, the number of vendors has not increased in like proportion; for whereas in 1860 there were under 10,000 vendors, there are at the present time but 23,000, indicating notwithstanding the total sales are five times as large as they were a generation ago, that the registration of vendors has only increased to half that extent, and the sale, consequently, by each licensed vendor has practically doubled.

You possibly have not reckoned how large a sum the public parts with in satisfying its craving for stamped medicines, and will be surprised to learn that the amount is not far short of 1½ millions sterling annually.

It is obvious that considerable advantages would accrue to the medical profession and pharmacy even if a portion only of such sum were directed into the channels of legitimate medicine. (Applause.)

Those in contact with this evil have an opportunity of watching the results from a social standpoint, and cannot be expected to be oblivious to its medical aspect. Each year, I have but little doubt, finds you with stronger convictions that the unrestricted sale to the public of many substances and compounds which are now commonly sold as patent medicines, and which are easily obtainable on account of the facilities offered by the medicine-stamp traffic, is a subject of deep concern, and a prolific source of both mental and physical degradation to the public.

The medical profession is aware that a section of the public become habituated to the use of hydrate of chloral, opiates, and other narcotics solely from the cloak that is adroitly spread around this matter by the medicine-stamp regulation.

Within the past month, and since my address has been in manuscript, the *British Medical Journal* has in a very able article, entitled "Poisons on Sale," directed the attention

of the medical profession to this important subject. I endorse the views of that journal when it says:—

"The whole question of the sale of proprietary medicines demands serious consideration. The apparent official sanction of the Government stamp, which has actually no more intrinsic signification than that affixed to a promissory note, indicates some sort of official approval or guarantee of the virtues of the medicine itself. It is simply absurd that the sale of poisons—narcotics, for example—should be hedged about with legislative restrictions when their nature and strength are fully known, and that the very same poisons should be freely sold when their nature is a matter of conjecture, and the proportion in which they are present is unknown, and probably variable." (Hear, hear.)

A refusal to supply poisonous patent medicines except under a medical prescription is resented by the public, and the patent-medicine vendor, who may be a grocer, stationer, or any individual, without the faintest knowledge of drugs, may, for a small fee to be paid for a licence, sow poisons broadcast.

The importance of this subject should be urged upon the medical department of the Privy Council by medical officers of health, coroners, and medical practitioners generally; and members of the Legislature should be asked to put pressure on the Chancellor of the Exchequer so that, notwithstanding his greed for revenue, a continuance of the tax would be impossible.

As legislation for regulating the practice and sale of medicine is now all professedly for the safety of the public, it becomes a question as to whether the compounding of all proprietary medicines should not be subjected to similar restrictions to those imposed in Germany and elsewhere on the Continent of Europe, where the composition of each so-called patent medicine has not only to be stated to a recognised authority, but permission obtained for its sale.

In my opinion, the time has come when the medicine-stamp should altogether be dispensed with. Such a course would recommend itself to those free-traders who, although liberal in their views concerning the sale of harmless medicinal substances, are not advocates for the unrestricted sale of poisons to the public.

I have spoken lengthily on this unfortunate fashion in which the public now indulges to its own detriment and to the great damage of the practice of medicine, and I feel confident that my suggestion will have your careful thought. Any action you decide upon should have as its mainspring the better protection of the public; and the support and co-operation of the medical profession, not only in this matter, but in any desirable movement connected with the advancement of the art and science of medicine may be confidently relied upon. (Hear, hear.)

PHARMACISTS AND THE PHARMACOPŒIA.

The time has at last come when those who practise legitimate pharmacy may, without arrogance, view their relation with the medical profession, and with the General Medical Council in particular, with the greatest satisfaction and pleasure.

For the past thirty years discontent has been rife, that pharmacists were not officially invited to co-operate with the body legally entrusted with the production of the British Pharmacopœia.

The Pharmaceutical Society's executive had oftentimes to listen to bitter sayings which we have no wish to recall, and desire only to refer to the advice that the forbearing President invariably gave, viz., that "everything would come to those who would wait." No little advantage has been derived from the fact that the editor of the *Pharmacopœia*, in his annual report to the General Medical Council, has never lost sight of the value of pharmacists' co-operation, nor an opportunity of showing of what practical value the pharmacist's information is in the production of the *Pharmacopœia*, which he, as editor, aims to make, not only an exponent of medicine as practised in Great Britain and Ireland, but a book of reference for the medical profession and pharmacists throughout the civilised world.

The British Pharmaceutical Conference has in some degree contributed to bringing about a better appreciation

of pharmacists by the medical profession, for many of the more important communications that have appeared in the "Year-book of Pharmacy" have from time to time been the subject of favourable comment in the medical press, and have not been without their influence upon medicine and surgery.

THE CONFERENCE AND ITS VIRTUES.

The Association has been popular—and deservedly so—for in its infancy it was fondled by the best pharmacists. England has produced, and now in its maturer years we find it healthy and capable of doing good work.

Each member of this Association should strive for the maintenance and enlargement of the influence alluded to upon the medical profession, and no firmer step can be taken in this direction than by a strict adhesion to the admirable principles laid down at Newcastle in 1866 by the fathers of our Association, some of whom I am delighted to see amongst us to-day. (Applause.)

Men should never enter the ranks of pharmacy without a recognition of the absolute necessity for patient and persevering study and continuous observation and thought, and students must be disabused of the idea that the object of their education and work is solely for examinations. Those who always continue students, and learn that increased knowledge brings a wider field of thought and observation, are the backbone of this Association—those whose acquirements are completed with examination are millstones round its neck.

As a member of this Association for upwards of twenty-five years, I may be permitted to refer to the opportunity this annual meeting gives for knowing, cultivating, and enjoying the friendship of one's *confrères*.

There is necessity at the present time to counteract the depressing influence of the cloud that will persist in hovering over us as a trade, by our seeking individually and collectively not only to maintain, but also to advance, by research and every possible means, all matters having a scientific bearing upon pharmacy. (Loud applause.)

Dr. THRESH, in proposing a vote of thanks to the President for his address, said: If anyone questioned whether the Conference justified its existence or not—and he had heard people doubt it—attendance at the *conversazione* on the previous night, and listening to the President's address that morning, would have dispelled all doubts on that point. (Cheers.) They met on the previous night old and dear friends whom they had not seen since the preceding Conference, and that morning they had heard an address on pharmacy of such an interesting and practical character that it alone would have been worth coming for, if for nothing else than to hear it. (Hear, hear.) The President had touched on a great many points, and had he (Dr. Thresh) known that it would have been necessary for him to make any remarks on the address he would probably have thought out some observations. The fashion in medicine which had been referred to was something to be deprecated. He remembered when he first began to be connected with pharmacy that the public relied upon senna and salts and sweet nitre for their domestic medicine. Now they found the public went in for all kinds of proprietary medicines. No doubt the fashion had been set them by the medical profession to a great extent. He had heard many people—educated people who hought patent medicines, express the idea that a patent medicine was something which required superior knowledge and skill to produce, and because it had got a stamp upon it it bore the sign of the Government that it was something over and above what the ordinary pharmacist, or even a medical man, could prescribe. The sooner the public were disabused of that the better it would be for the pharmacists and the medical profession also. (Cheers.) He had recently had many opportunities of coming into contact with members of the profession of medicine, and it had pleased him enormously to find that there was a change coming over the profession in connection with its opinion of pharmacy and pharmacists. There were medical men who seemed to envy the pharmacists their superior knowledge of pharmacy, and felt that if they possessed it, they would be able to prescribe with greater skill; but, instead of giving the pharmacists credit for possessing that knowledge, they seemed to be envious and almost scurrilous in their remarks; but, on the other hand, when they went amongst the other members of

the profession they found that better acquaintance with the work done by pharmacists was raising the status of the pharmaceutical profession. He had listened with the greatest pleasure to Mr. Umney's address, and he had no doubt they would carry the resolution of thanks with acclamation. (Cheers.)

Mr. BRANSON seconded the motion.

Mr. SCHACHT, in putting the resolution, as a past-President, said his duty might very well be performed in a perfunctory manner, but he thought they would allow him the pleasure of saying that he had the greatest pleasure in performing it. He, for his sins, had to bear for two consecutive years the duties of President, and he felt then the very great difficulty of attempting a second time to interest an audience such as that. The other day he did the extremely bold thing of re-reading his two addresses. That was an achievement which no other past-President had ever accomplished. (Laughter.) Certainly it was a trouble. But he found that he created a magnificent anti-climax. Whatever merit there was in the first was not approached in the second. In listening to Mr. Umney for the second time he felt exactly the reverse of what he felt in reading his own two addresses. Mr. Umney had kept the good wine until now. (Hear, hear.)

The motion was carried by acclamation.

The PRESIDENT thanked the mover and seconder of the resolution and the meeting for their kind appreciation, not only on this occasion, but at Newcastle, of his humble efforts to deal with something which was of passing interest. He was very glad to hear from Dr. Thresh that pharmacists were growing in the estimation of the medical profession. (Hear, hear.) Dr. Thresh was just in a position to be an acute observer of both sides, being connected to the medical profession on one side and to pharmacists on the other, and he knew no one more competent to observe than Dr. Thresh. (Cheers.)

THE FORMULARY.

Mr. MARTINDALE then reported that at the end of last year, with the sanction of the Executive, the Committee published an addendum, containing nine formulæ, which was included in the "Year-book" and issued bound with the then existing copies of the Formulary. Their work, for the present, remained in abeyance pending the issue of an official addendum to the British Pharmacopœia; but they hoped to renew their labours after that was published. He might add that their labours had been remunerative to the Conference.

The PRESIDENT said they had often to appreciate the Unofficial Formulary. Before its publication they had sometimes the greatest concern in the matter of compounding medicines for which there was no recognised formula. The production of the Formulary had been of great help to pharmacists, and there had been nothing in their time that had produced such a uniformity in medicines in occasional use as the production of that book. (Cheers.)

The reading and discussion of papers was then commenced, the first being

THE ALKALOIDAL VALUE OF ANNUAL AND BIENNIAL HENBANE.

By A. W. Gerrard, F.C.S.

A question which a long time ago occurred to me as worthy of investigation—and it is a question which, no doubt, has often occurred to others—was whether any differences would be found in the alkaloidal values of the annual and biennial varieties of henbane. It is well known to have long been the custom in most countries to regard biennial henbane as possessing more active therapeutic properties than the annual kind. Support is given to this view by the fact that the biennial henbane is the variety found in most Pharmacopœias. A search for evidence in support of this preferential selection has not yielded any satisfactory results, and there do not seem to have been any chemical or pharmacological investigations made which lend support to this supposed superiority. On the other hand, Royle, in his "Materia Medica," speaks of the annual variety cultivated in the botanical gardens of Saharunpore, and the extract made from it, as being of excellent quality, as proved by trials in the General Hospital, Calcutta. As regards first year's biennial henbane-root, it is but fair to

state that the late Mr. Peter Squire pointed out that this root and an extract made from it were relatively far more active than the leaf or its extract. Moreover, this statement was chiefly based upon the therapeutic experiments of Dr. Gee, of St. Bartholomew's Hospital. No estimation of the active principles of the root appear to have been made. It will thus be seen that the information at my disposal is of a very meagre kind—in fact, Flückiger and Hanbury state in "Pharmacographia" that "no attempt has been made with accuracy to determine the relative merits of the various sorts of henbane." For the purpose of my experiments three samples of each kind of henbane were obtained from various parts of the country. The parts of the plant used were the leaves and tops of the annual variety, the first year's leaves and root of the biennial kind, likewise the second year's tops of the latter. These selections were made for the reason that, except the root, they represent the varieties of henbane grown in this country. The method of treatment, or process of extraction, was the same in each case, as follows: The root or leaf, after having been air-dried, was placed in a large shallow porcelain-lined pan, and dried over a water-bath until its weight remained constant. One kilogramme of the dried substance was at once taken and reduced to powder. This was macerated and percolated with proof spirit till exhaustion was complete. The final portion was next distilled to remove spirit, and the residue from the still evaporated to a semi-fluid extract. For the purpose of removing resin-like and colouring matters, the extract was diluted with water containing 1 per 1,000 hydrochloric acid until it ceased to precipitate, then again filtered and made to a volume of 100 c.c. by addition of water. For the removal of the alkaloid, the solution of the former process was treated with ammonium hydrate in excess, and the alkaloid shaken out therefrom three consecutive times with chloroform. The separated and mixed chloroformic solutions were exposed to the air for a few hours to allow free ammonia to escape, after which the chloroform was shaken with dilute hydrochloric acid, whereby the whole of the alkaloid was removed as hydrochlorate. After concentrating the hydrochlorate to a small volume the alkaloid was finally removed by a fresh addition of ammonium hydrate, and several shakings with ether; on evaporation of the ether, the alkaloid was obtained, in a partly crystalline, partly amorphous state.

The estimation of the alkaloid in the previous residue was done volumetrically, by means of a solution of hydrochloric acid, containing 35.5 of the acid in 10,000 parts. Each c.c. of this solution is equivalent to .0289 gramme of either hyoscyamine or atropine; so, assuming both alkaloids to be present, no error would arise from this method of estimation. In all cases, except one, check analyses were made, the results of which were confirmatory of the others.

The following table shows the variety of henbane, part used, where grown, and yield of alkaloids.

Variety and Part Used	Where Grown	Yield of Alkaloids from 1,000 parts
Biennial Roots (First year) ..	Middlesex	1.602
" " " " ..	Sussex	1.550
" " " " ..	Lincolnshire	1.729
" First Year's Leaf ..	"	.693
" " " " ..	Sussex	.667
" " " " ..	Middlesex	.592
" Second Year's Tops ..	"	.672
" " " " ..	Sussex	.680
" " " " ..	Lincolnshire	.656
Annual Leaves and Tops ..	Leicestershire	.641
" " " " ..	Surrey	.689
" " " " ..	Middlesex	.701

An examination of the table shows three important facts—first, that annual henbane leaf, first year's biennial leaf, and second year's biennial tops have practically the same value; second, that first year's biennial root is richer in alkaloid than either leaf or tops; third, that locality of growth does not appear to influence the amount of alkaloid. It was further remarked that the biennial root with rectified spirit makes an excellent extract, which could be easily standardised.

As regards the preference for biennial over annual hen

bane leaves, it seems that the practice is founded entirely upon prejudice, which may be accounted for by the finer and more handsome growth of the biennial plant, likewise its more interesting natural history; these, together with its selection by the Pharmacopœia authorities, have given it a position to which it does not appear entitled. Turning to the question of the therapeutic properties of the two henbanes, it is highly improbable that any difference will be found, seeing that the active principles are the same, and present in the same proportions. One other point developed by the analyses is the uniformity of strength of both varieties of leaf. It therefore follows, if care be exercised by the pharmacist in selecting good and fresh English henbane, he may rely upon his preparation of the drug being of good quality and uniform strength.

Mr. GERRARD added that he had that morning received a letter from Mr. Holland, of Market Deeping, referring to some fine fresh specimens, which were exhibited to the meeting. Mr. Holland said in his letter that the plants were gathered from a field with gravelly soil, where the first year's biennial plants were coming up. Only the two specimens sent had flowered. Mr. Holland referred to one specimen as a "sport"—that is, something abnormal. He supposed he alluded to the fact that it had flowered the first year, as carrot and mangel wurzel occasionally did. Mr. Gerrard went on to say that he had brought a specimen of some he had gathered himself in the neighbourhood of Bognor, in Sussex, on Saturday and Sunday last. He happened to have known some years ago that the biennial henbane was indigenous in that neighbourhood, and had seen 100 or 200 plants growing there. On Saturday and Sunday he had a search for some, and this specimen was found; but the roots were small as compared with Mr. Holland's cultivated roots. He also produced another specimen which had completed its second year's growth. The large root which existed in the past year had shrivelled up at the completion of the growth, the plant having gone to seed. The root in the first year's growth was very large, and went on growing until December, when it had become as thick as a parsnip.

DISCUSSION.

The PRESIDENT said he was sure they were very much obliged to Mr. Gerrard for bringing forward this subject again. He thought some five or six years ago Mr. Gerrard corroborated some statements in reference to henbane made, he thought, by Mr. Gilmour, of Edinburgh. He was glad that Mr. Gerrard did not let the matter rest there, but had continued his observation, and had brought before them valuable information. For years they had been held down by rule of thumb, and they had now learned for the first time that the annual henbane was as good as the biennial henbane. He recalled the fact that Mr. William Gilmour had some years ago, in THE CHEMIST AND DRUGGIST, dealt very fully with this subject in an exceedingly interesting paper, and there had been very marvellous researches in reference to the alkaloids of henbane, hyoscyamine and atropine, and he had no doubt Mr. Gerrard had not lost sight of the fact discovered and recorded by Will that hyoscyamine could now be converted into atropine. In reference to the roots on which Mr. Gerrard had commented, he did not quite follow whether Mr. Gerrard had examined the roots of annual henbane. It was, as he understood it, rather the roots of the biennial plant that he had more particularly examined, at the end of the first year of growth. He knew that Mr. Holland had many acres of henbane under cultivation, and he thought it was a subject on which they should have more knowledge.

Mr. MARTINDALE said that on the south coast, near the seashore, there was an abundance of henbane. He saw it growing near Rye there this summer in a very luxuriant condition. The annual henbane had scarcely any root at all; it was only when it was preserving its root for a second year's existence that it got into that fleshy condition.

Mr. HASSELBY said he had taken a considerable amount of interest in the growth of the various henbanes, his attention having been drawn to it very much by a practical experience. When he was in business at Goole he purchased from Hodgkinson, Stead & Treacher some biennial henbane, and made a tincture of it, believing it to be the best. A short time after a lady called to have a prescription by an eminent

Hull physician dispensed, and he dispensed it with this biennial tincture. In a few days she brought the mixture back, and asked him if he wished to poison her. (Laughter.) She was quite sure that he had made a mistake, as she had had it dispensed previously by a leading house in Hull. He had not done her any great harm; but she hoped it would be a lesson to him to be careful. (Renewed laughter.) He got her to smell the bottles from which the medicine was prepared, and the one she objected to was the henbane. She said it was poisonous; it smelled tremendously. (Great laughter.) He told her that the best way would be for him to see the doctor in Hull who had given the prescription, and ask his opinion. He accordingly took the preparation to the doctor, who pronounced it accurately dispensed; and ever after that he got all that physician's prescriptions which came into the district. That showed the benefit of keeping a good article. They were aware that henbane was very costly, and some years ago he read a paper at the Hastings Conference stating that every chemist who had anything of a garden might grow the henbane. The initial difficulty was the greatest—try where they would they could not get the biennial seed. He tried some out of his hothouse, but it was generally kiln-dried, and its properties were thereby destroyed. Why that should be so he could not tell, unless it was to prevent anyone else from growing it. (Laughter.) He tried a gentleman at Banbury without success; he wrote to the postmaster there and asked him if he could get him a little seed; he tried east and west and north and south; he tried Kew—but failed on every hand. The seed supplied to him came up annually. If they could only persuade Mr. Gerrard to give them one of the seed-pods he had there they might grow their own. With regard to the annual being equal to the biennial, some of them would give up the biennial tincture with regret. The odour and the resinous properties it possessed were distinctive, and the strong smell gave them the idea that there was more strength in the latter than in the former. He had often thought that a tincture made with the biennial leaf was costly, but it was a question whether they should use the root, and the Pharmacopœia would have to decide that. He believed that, owing to the excessive price of henbane, the leading London hospitals were prescribing belladonna in one-sixth quantity doses. He made an experiment, with a stock pill he had, of substituting for the hyoscyamus extract one-sixth of belladonna extract, and found it act just as well; but still, as his formula ordered extract of hyoscyamus, he did not like to tamper with it, and therefore reverted to the excessive-priced hyoscyamus. None of his customers ever complained of the belladonna, and he believed one was as good as the other, if used in diminished quantity.

Mr. R. H. DAVIES asked Mr. Gerrard whether his estimations had been based upon experiments with the dried root or leaf, or whether he had used the plant in a fresh condition?

Mr. OCTAVIUS CORDER had good reason to suppose that in many cases *Hyoscyamus niger* was not supplied at all, but a variety which grew very plentifully in many parts of South Germany and Switzerland—a plant which possessed little or no medicinal value.

Mr. R. A. CRIPPS noticed that in the account which Mr. Gerrard had given them the quantity he obtained averaged '6 per cent. in each case. As they all knew, a dose of the tincture of belladonna in the Pharmacopœia was far less than the dose of tincture of henbane, and, according to his experience, belladonna leaf did not contain as much as '6 per cent. of alkaloid, and yet, according to the paper, henbane was as strong as belladonna. It seemed strange to him that, if the alkaloids Mr. Gerrard obtained were only hyoscyamine and atropine, the dose of tincture of henbane should not in some cases act as a poison. He should like to know if Mr. Gerrard had continued his experiments in order to prove that the only alkaloids were those two; also if his experience of belladonna leaf had been different to his (Mr. Cripps's), and if he had obtained a far larger proportion of alkaloid from that plant. He was somewhat surprised at the large amount Mr. Gerrard had obtained from the roots of henbane. He took it that if the plant were taken up for the sake of the roots, it would not be altogether a wise commercial speculation, because they would spoil the plant for the next year.

Mr. ROBERT WRIGHT asked whether Mr. Gerrard had occasion to examine the commercial samples of henbane leaf. Although the process he had used had certainly been different from Mr. Gerrard's, he had found as a rule that biennial henbane leaves did not contain more than one-third of the alkaloid which Mr. Gerrard had obtained from his sample. With regard to tincture of belladonna his experience had been that, as a rule, the yield of alkaloid from the pharmacopœial tincture of belladonna exceeded the amount yielded by tincture of henbane.

Mr. CONROY said it was not quite clear to his mind whether Mr. Gerrard found 1.6 per cent. of alkaloid in the annual root or in the biennial root.

The PRESIDENT: In the annual root at the end of the first year 1.6 per cent. of alkaloid.

Mr. MACEWAN: Is it not per mille that is meant?

The PRESIDENT: That was from the roots—1.6 per cent. Perhaps Mr. Gerrard will reply to that.

Mr. GERRARD said he rather regretted he did not refer in his paper to Mr. Gilmour's papers, which appeared in THE CHEMIST AND DRUGGIST some few years ago, and which contained a pleasantly-written account of the annual and biennial henbane. Mr. Martindale had given the answer to the question with respect to the annual root—viz., that it was so small that it was not worth making a research upon it. At least, that was his opinion. Mr. Hasselby seems to have got into some little difficulty over his bottle of medicine. He thought he could account for that by saying that the leaf of the biennial henbane contained far more of the odorous principle than the leaf of the annual, and they knew the important influence which odour had over people. With regard to the difficulty of getting henbane seed, he had sent Mr. Hasselby some, if he recollected rightly, and he would vouch for the honesty of that seed. (Laughter.) But he would say this—that there was a great difficulty in getting henbane seed to grow. It seemed as though a large quantity of seed did not become fertilised, and the seeds would lie fallow for years, and then suddenly spring up in large quantity. It might be influenced, perhaps, to some extent, by the season of the year, but there was a difficulty in getting it to grow. With reference to the substitution of belladonna for henbane, he found in his hospital experience that extract of belladonna had taken the place of extract of henbane to a very great extent, and physicians and others who had been in the habit in years past of prescribing extract of henbane in aperient pills as a corrective now preferred to order belladonna, because they could rely upon it containing a more uniform amount of alkaloid than was present in henbane. So much had belladonna taken the place of henbane in the hospital with which he was connected, that while fifteen or sixteen years ago belladonna extract was purchased in quantities of perhaps 7 or 10 lbs. annually, they were now using 1 cwt. per annum. That would give them an idea of how the use of it had grown. With reference to the quantity of hyoscyamine and atropine which he had found in the roots and leaves, his references were, he would admit, confused, and in one part he said "per cent." when he should have said "per 1,000." It should have been .06. If they would accept that correction, then the yield of alkaloid in the root was $2\frac{1}{2}$ times as much. Although the root did not yield such an abundant crop as the leaf, that was no reason why they should reject the root. When they considered that it had $2\frac{1}{2}$ times the alkaloidal value, he maintained that they had an advantage on the side of the root; besides, the extract was of a more reliable character, and they could get from it an alcoholic extract, which was better than an aqueous extract, and kept better. They might keep the alcoholic extract for years, and it would not undergo any, or only very slight, deterioration as compared with the aqueous extract. He thanked them very much for the notice they had taken of the paper.

Mr. HENRY LONG asked whether Mr. Gerrard did not think that the administration of belladonna instead of henbane caused the deterioration of the eyesight of children, whom they saw going about with spectacles.

Mr. GERRARD replied that that was a medical question, which he really did not care about answering; he would leave that to the medical profession. (Laughter.)

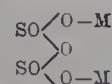
The PRESIDENT was sure they would thank Mr. Gerrard for his very practical and excellent paper. (Cheers.)

The next paper read was on

ALKALINE SULPHITES.

By C. H. Bothamley, F.I.C., F.C.S.

The author of this paper described its contents to the meeting in lecture style. He pointed out at the outset that sulphurous acid is dibasic and combines with alkalis to form normal sulphites, M_2SO_3 , and acid sulphites, $MHSO_3$. There is a third class of compounds to which the name meta-bisulphites, or meta-sulphites, has been given, and which are considered to be of recent introduction; but the author pointed out that this is not so, and that Muspratt many years ago described these compounds, giving them their true name, anhydro-sulphite. Their formula is $M_2S_2O_3$, and they are formed by the elimination of a molecule of water for two molecules of the acid sulphite, so that the constitution may be represented thus—



Anhydro-sulphites differ in many respects from the acid sulphites. They contain, it will be observed, no hydrogen, consequently, when heated they do not give off water vapour, but sulphurous acid vapour, leaving a residue, sulphur and the normal sulphate. At the ordinary temperature anhydro-sulphites are very stable. The chief object of the paper, the author stated, was to describe the alkaline sulphites, especially in regard to the purity of commercial samples. He pointed out that acid sulphites are as difficult to make and as difficult to keep as the acid chromates, the tendency being for them to change into the anhydro-sulphite, just as the free chromates change into so-called bi-chromates, or anhydro-chromates, $K_2Cr_2O_7$. Sodium sulphite, as it occurs in commerce, is generally pure, but many samples are exceedingly impure, the impurities being carbonate and sulphate. These impurities have the property of making the salt efflorescent, whereas the pure salt retains its beautiful transparency under ordinary conditions. The normal and acid sulphites of potash could not be procured in the ordinary channels, and it was assumed that those were not commercial products. Samples of acid sulphite of soda obtained from several sources were found to yield 8.1, 34.14, 22.3, and 39 per cent. of sulphurous anhydride; the pure salt would contain 61.54 per cent. The chief impurity in these salts was sulphate, which was extremely difficult to remove, and it was practically impossible to make absolutely pure salt—indeed, it was questionable if it had ever been isolated. Various chemists had tried it at different times, amongst them Berthelot, who never succeeded in getting it. The author himself had tried, but without success, because any endeavour to crystallise it out always resulted in a change to the anhydro salt. Speaking of this anhydro-sulphite, he said that, although it lost a little sulphurous anhydride, this was entirely superficial, and the layer of new compounds formed acted as a perfect protective, so that decomposition never proceeded very far, as may be judged from the fact that commercial samples yielded 52.54, 56.02, and 57.42 per cent. of sulphurous anhydride, the calculated amount being 57.63 per cent. It was therefore evident the commercial salt is very satisfactory, and it is noticeable that those of poorer quality were specimens in small crystals, which offered a greater surface to atmospheric action. Mr. Bothamley proceeded to detail experiments which he had made himself in the preparation of this salt, and he concluded by stating that when a really pure sulphite is wanted the anhydro-sulphite is the one which should be used.

DISCUSSION.

The PRESIDENT said the paper was of great value, and he should be glad to hear remarks upon it. These salts were of very great importance, both in the arts and in medicine, when they wanted a large quantity of sulphurous anhydride.

Dr. THRESH said he really did not know what sulphurous anhydride was largely used for in medicine, unless it was for disinfecting purposes. No doubt a large quantity was so used, but they always obtained it by burning sulphur; they would never think of using preparations of that kind. If

any chemist could find something that was more effectual than sulphurous anhydride, medical officers would be glad to hear of it. For his own part he had very little faith in it. They went into cottages and burnt sulphur to satisfy the minds of the people, but it did not satisfy his own mind; and, if they could get some easily-applied disinfectant which would kill the bacteria and not affect the polish of the furniture or the colour of the bed-hangings and so forth, a boon would be conferred upon medical officers and upon the community at large. He remembered at the time of the cattle plague some veterinary surgeons were anxious to try the effect of bisulphite. A number of samples were obtained, and he came to the conclusion with regard to them that they contained very little sulphurous acid, and if that was to be the active agent it was a mistake to employ the bisulphite.

Mr. SIEBOLD asked Mr. Bothamley whether he had extended his experiments to calcium bisulphite, and whether that was not a much more satisfactory and suitable preparation than the corresponding sodium or potassium salt. He asked because many years ago it had been stated that when they dissolved calcium phosphate in sulphurous acid they could evaporate that to a solid product without any loss of sulphurous anhydride, and the only explanation he could think of for that was, there seemed to be formed an acid calcium sulphide by dissolving the phosphate in the sulphurous acid, and that must be a very stable preparation.

Mr. NAYLOR said he was rather surprised to see the results given with reference to the normal sulphite of sodium. He had had the opportunity of examining that from time to time, and he had found, in years gone by, quite as much as 20 or 30 per cent. of sulphate; but he was not aware how those samples had been collected. They were not particularly concerned as to their manufacture. But it was quite easy to obtain samples of sodium in the market which contained as small a percentage as 5 per cent. of sulphate. He did not think that bisulphite of potassium was obtainable in the market except in the form of a very strong solution. He was not quite certain if bisulphite of ammonium had ever been obtained in a crystallised form.

Mr. DAVIES asked Mr. Bothamley, who had alluded to the use of acid sulphite for the removal of ketones and aldehyde, whether the use of the meta-sulphite was equally effectual with the more usual acid compound used for that purpose.

Mr. BOTHAMLEY, in reply, said that anhydro-sulphites were as good as the sulphites for the purpose. The point raised by Dr. Tresham as to sulphur-dioxide as a disinfectant did not exactly bear on his paper. He did not believe it was generally known, but it had been shown that when sulphur was burned at least 8 per cent. of it was converted into sulphur trioxide, and he need scarcely point out that the corrosive effect of that would be very much greater than if they could in some way or other obtain perfectly pure sulphur dioxide. The germicidal action of sulphur dioxide was of a selective kind. It had been shown that, whilst it killed a large number of germs, others flourished quite vigorously in the presence of large quantities of sulphur dioxide; but he was not aware of any special experiments having been made as to its action upon the zymotic germs as distinct from the numerous other germs. He had not made any experiments with calcium bisulphite, because it was not a product one commonly saw in the laboratory. His attention was drawn to this matter by the extremely unsatisfactory character of the so-called bisulphites they obtained for laboratory and other purposes. The mere fact that they could evaporate a solution of calcium bisulphite without loss was tolerably conclusive that it was not calcium bisulphite, but calcium anhydro-sulphite. It appeared that they could not obtain the bisulphites any more than they could get the hydrogen chromates or dichromates.

The PRESIDENT then called upon Mr. Ransom to read a paper on

STROPHANTHUS HISPIDUS.

By E. M. Holmes, F.L.S.

Since their introduction as a medicine strophanthus seeds have varied considerably in quality, so that great variation must have been experienced in the therapeutic value of its preparations. The seeds first used and described by Professor Fraser were thought to be derived from the plant described by Professor Oliver in Hooker's "Icones

Plantarum," under the name of *Strophanthus Kombe*, Oliv., but which is now regarded as a "variety, a geographical race, of *S. hispidus*." The flowers of the plant which yielded these specimens have been submitted by Dr. Fraser to Professor Oliver, who "expresses the opinion that they are the flowers of *S. hispidus*." Mr. Holmes pointed out, however, that the seeds employed by Professor Fraser differ both in size and colour from those obtained from the typical *Strophanthus hispidus* of the West Coast of Africa, this opinion being based on a careful examination of specimens obtained at different times, and he wished to emphasise the fact that the seeds originally used by Professor Fraser differ from those yielded by the typical *S. hispidus* of West Africa, so that preparations made from West African seeds may differ considerably in action from those made with East African seeds. It is, therefore, important to note that (1) the seed used by Professor Fraser possess the following characters: In bulk some of the seeds appear to be of a greyish-green colour and others of a fawn colour. This, however, is an optical illusion, which is readily dissipated by altering the angle and direction of the seeds to the light. The hairs on the seeds all point in one direction, and are somewhat appressed to the seed coat. If the seed be first presented towards the light, so that the apex is towards the light, and then by reversing the seed so that the base of the hair is presented to the light, and varying the angle of incidence, it will be seen that the fawn colour appears green and *vice versa*. (2) The seeds vary in quality according to the degree of ripeness of the pods, and the carefulness with which they have been dried. On breaking a seed across it should exhibit a firm white endosperm, showing under a good lens a line marking the enclosed cotyledon. All seeds that are sbrunken or shrivelled, or that show a dark-coloured interior, should be discarded. (3) All seeds that have not a hairy surface, and in which the hairs do not present the alternating greyish-green and fawn colour, should not be employed. There has occurred in commerce a mixture of glabrous seeds with hairy seeds, and also a somewhat twisted non-hairy seed belonging to a different genus, *Kickxia Africana*. The latter are easily recognised by the different shape, and the fact that the cotyledons are seen to be doubly folded when a seed is broken transversely. These characteristics suffice to distinguish true from false seeds. Mr. Holmes proceeded to speak of the glucoside, ouabain, showing how it differs from strophanthin.

In connection with this paper two leaves were sent by Mr. Thomas Christy from a plant grown by him, and which was propagated from a sample of seeds the origin of which was in doubt. Mr. Holmes wrote from Edinburgh to the effect that he had no doubt that the plant which yields true strophanthus seeds should be called *S. hispidus*, var. *Kombe*, and that Arnaud's ouabain is strophanthidin, which is a body formed by splitting up strophanthin. Arnaud actually uses acetic acid in his process, and this suffices to effect the decomposition.

DISCUSSION.

The PRESIDENT said they were much obliged to Mr. Holmes for the contribution, which had arrived at a very opportune moment, as the Pharmacopœia Committee of the Medical Council desired to include strophanthus as one of the preparations in the addendum to the Pharmacopœia. He could safely say that the more he saw of strophanthus—and he saw it again and again in the London drug market—the less he felt certain about it; and his colleagues on the Pharmacopœia Committee would be glad of the assistance given by Mr. Holmes. Professor Fraser's work, they all knew, had been of the most thorough character, and was of great value. There was much uncertainty about the subject, and Mr. Christy, by his letter received that morning, showed that he was by no means certain about the plant which yielded the leaves which he had sent.

Mr. N. H. MARTIN said it was of extreme importance that the commercial history of the drug should be better known. There was no doubt a certain amount of confusion surrounding the selection and importation of the seed, arising from the impossibility of controlling the gathering of the seed. It was very difficult to know what plant actually provided the seeds of commerce. The earlier experiments

with strophanthus by medical men were undoubtedly made with the green or fawn coloured seeds, and when these were obtainable a good result was almost uniformly got from tincture of strophanthus; but it was quite impossible to get these seeds in the London market, and they were thrown upon the seeds they had there, so that great diversity of effect had arisen and results were disappointing. He had hoped that Mr. Holmes would have cleared up more than the history of the seed, and given them something to guide them in its selection.

The PRESIDENT thanked Mr. Holmes for his contribution, and the following paper was then read:—

THE ESTIMATION OF NITRITES IN POTABLE WATERS.

By Dr. J. C. Thresh, Medical Officer of Health for Chelmsford and Maldon.

In carrying out a series of investigations as to the changes which take place in many waters when kept under favourable conditions, the want of a simple and rapid quantitative test for nitrites made itself felt. None of the ordinary processes answered the required purpose, and, therefore, the author was induced to attempt to make the exceedingly delicate potassium iodide and starch test an available colorimetric one. The experiments made with this object proved:—

1. That with the same proportions of acid, starch, and potassium iodide, the rapidity with which the blue tint develops and the depth of the tint vary with the degree of oxygenation of the water.

2. The depth of colour increases with the time of exposure, since the liberated NO acts continuously as a carrier of oxygen.

3. Temperature has a very appreciable effect.

4. Other things being equal, the stronger the acid and the larger the proportion of potassium iodide added, the more rapidly is iodine liberated.

5. The quantity and quality of the starch solution also affect the result.

6. When all the above factors are constant, then the rapidity with which the blue tint develops varies with the amount of nitrite present. To obtain satisfactory results it is, therefore, necessary to work with waters at about the same temperature, which have been well shaken with air, and have then been treated with exactly the same quantity of each reagent.

The reagents required are as follows:—

1. Solution of Potassium Iodide and Starch.

Starch (in powder)	2 grammes
Caustic potash	1 "
Potassium iodide	2 "
Water	200 c.c.

Dissolve the starch in about 10 c.c. of water, to which the caustic potash has been added. Heating is unnecessary. The solution keeps well.

2. Dilute Sulphuric Acid.

	Parts
Pure acid	1
Water.. ..	3

Mix.

3. Solution of Sodium Nitrite.

Pure sodium nitrite	·493 gram.
Water	1 litre

1 c.c. = 1 mgr. nitrogen.

Apparatus required: a few small pipettes and 50 c.c. Nessler cylinders.

Process.—Shake the sample of water vigorously in a partially-filled bottle to saturate with air, pour 50 c.c. into the cylinder and add 1 c.c. of the starch and iodide solution, and afterwards 1 c.c. of the dilute acid. Stir gently. Assuming the temperature to be about 60° F., if a blue tint develops instantly on addition of the acid, the water contains more than 1 part per million of nitrous nitrogen. If the blue tint shows only after a few seconds, it contains about ·1 per million. If it requires more than about 10 seconds to develop, it contains less than that amount.

In the first case the water is too strong for estimation, and it must be diluted with nitrite-free water in such proportion until an experiment shows that the colour appears only after standing a few seconds.

With a little experience the approximate amount of nitrite present can be ascertained with considerable precision by these simple preliminary experiments.

Now prepare a standard nitrite solution by diluting 1 c.c. of the above solution of sodium nitrite to 200 c.c. Each c.c. of this standard, diluted in the Nessler cylinder to 50 c.c., corresponds to ·01 nitrogen per litre.

Measure into two or more Nessler glasses varying quantities of this standard solution, and fill up with the aerated water. Now take 50 c.c. of the water to be examined, or of the previously diluted water, if such dilution were found necessary, and add to each, successively and rapidly, 1 c.c. of the starch solution, and 1 c.c. of the acid. If none of the prepared solutions correspond in strength with the water fresh trials must be made.

The following are the notes on an estimation:—

50 c.c. + reagents. Blue in about 10 seconds.

Compared with—

·10 per litre (10 c.c. standard dil. to 50 c.c.). This was a little too strong.

Compared with—

·05.	Too weak.
·07.	Too weak.
·09.	Too strong.

Tried again with—

·08. Little too strong.

Estimated therefore at ·075 N per litre.

Real strength was ·070 N per litre.

Numerous determinations with all kinds of potable waters prove that the process is reliable. A determination only takes about five minutes as a rule. The reagents are easily made and preserved, and the conditions to be observed are easily attained. For the above reasons the author commends it to the notice of such analysts as desire to record the amount of nitrites in water examined. In the course of the paper Dr. Thresh mentioned that he had come across samples of water in which the nitrite fluctuated, and this it will be seen was a point which was considered in the course of the

DISCUSSION.

The PRESIDENT said they were much obliged to Dr. Thresh for bringing this matter before them. Public analysts were very often called upon to analyse water, and they would find Dr. Thresh's paper reliable.

Mr. STROTHER asked if any gentleman had any analysis of the water of Leeds. It did not bear on the communication by Dr. Thresh, but he was given to understand that there was an absence of lime in the water, which had a peculiar effect in retarding osseous formation of young children.

Mr. REYNOLDS said there was very little lime in the water of Leeds. They had considered this subject last year, and had done a useful work in spreading information as to the danger that surrounded large populations in connection with the use of lead pipes in water supply. Fortunately the water of Leeds was not so wanting in lime as to be one of the most dangerous in its action on lead pipes; but one must admit that under some conditions, especially the pipes connected with hot-water systems, a very slight action did take place. But as to the definite question referred to, the influence of lime in the food on the growth of young children, he could not speak. Like most other towns that had imitated the example set by Glasgow in taking the Loch Katrine water, the Leeds people had been seeking for water of a soft character for supplying the manufacturing population, and, in common with other towns in the West Riding, he thought they would get wisdom as they went along. Leeds water contained, perhaps, 6 grains per gallon solid matter, and the hardness was about 4 degrees. The Leeds people were very well satisfied with it, and he believed no treatment had taken place. He saw Mr. Rimmington present, and he might give them some information.

Mr. RIMMINGTON said that until the dry summer Bradford water never used to have a deleterious effect. Since that time many people said that the high-level water was dangerous, and there were many cases of illness attributed to lead poisoning. It was difficult to trace it, and difficult to say where the evil was. It was a subject he would rather not discuss.

Mr. SIEBOLD said that to his mind one of the most interesting points in Dr. Thresh's paper was the one which alluded to the formation of nitrites in a sample of water, and their subsequent disappearance. He hoped that Dr. Thresh would go on with the investigation of the matter, because further inquiry might throw an important light on the subject of water analysis. At the present moment the importance of nitrites in water was not fully understood, and the mere fact that water might contain nitrites one day and no nitrites the next showed that the question of whether a particular sample of water contained nitrites or not was not of much consequence. They might have to watch changes of the water for some time instead of making an analysis every day or two. A peculiar circumstance in connection with water analysis occurred to him recently. A medical gentleman sent him a sample of water to test, about eighteen months or two years ago, and told him there was a suspicion that the water had caused the spread of some disease. The analysis, conducted in the ordinary way, showed nothing suspicious whatever. About 30 oz of the water remaining from the analysis was left in a bottle, and after a considerable time it showed a large amount of bacteria, which had since gone on increasing. Upon evaporating about 20 oz. of the water, the residue gave a certain indication of the presence of ptomaines. A little acid in the water would exclude the possibility of the reaction of such substances as nitrites or others which might react similarly to the ptomaines; and from these observations he believed the time would come when the watching of water for some time would be one of the rules of analysis, and it might not be very rash to predict that a careful search for ptomaines—those very poisonous bodies produced by bacteria, and which were the cause of the injurious action upon health, rather than the bacteria themselves—would form a necessary and important part of water analysis.

Mr. SCHACHT asked whether the presence of nitrites was likely to be due to the oxidation of nitrogen previously not in combination. The general inference when they found nitrites was that they resulted from the imperfect oxidation of nitrogen, and the natural purification of water, so to speak, was that it should ultimately appear as nitrites; but he could hardly understand the reference which Dr. Thresh had made to albuminoid ammonia, for in a few days it would be scarcely possible for a large amount of nitrites to appear from the oxidation process.

Mr. RIMMINGTON said he often found that in water containing nitrites there was no albuminoid ammonia.

Mr. SCHACHT thought Mr. Rimmington hardly meant that to be a universal law.

Mr. RIMMINGTON: I say I frequently find it.

Mr. BARCLAY, jun., said that some few months ago a water came under his notice in which two samples were seen, both supplied from the same source, the one being supplied through lead pipes, the other through zinc pipes. On analysis it was found that the one which came through lead contained nitrites, but that which came through zinc contained none, the deduction being that the zinc caused the absence of the nitrites. Whether it was thrown out as nitrates, or what was the cause of their absence, in the second place it was hard to say. (Hear, hear.)

Mr. SCHACHT pointed out that Dr. Thresh agreed with the view Mr. Ekin urged in his little book on potable waters—that he still found the greatest possible reliance could be placed on the old iodide of starch.

Dr. THRESH, in reply, said waters containing nitrites could be divided into two classes; in one they found nitrites upon examination, and if they examined them day by day they gradually decreased until they disappeared altogether. Sometimes they continued a day or two, sometimes a fortnight. In others the nitrites increased up to a maximum and then they would disappear. But in this particular case, as the nitrites increased the nitrates decreased, until ultimately there was not a trace of nitrogen present; the whole was reduced to a nitrous condition; but there was no increase of free ammonia, but a marked increase of albuminoid ammonia. He very much wanted to go on with the study of the water, because it had opened out to him a number of interesting problems, and, in discussing the matter with Mr. Siebold on the previous night, and mentioning ptomaines, he found the same thing had occurred in both. He certainly

found indications of ptomaines. He was certainly of opinion that the watching of the changes that took place in some of these waters would ultimately be of primary importance. It was probable that they might find that those organisms which had a deleterious effect on human health had a certain influence on the water, whereas other organisms might have a different effect; and it was possible, by watching, that results might be obtained of considerable importance to the health of the community. There was no doubt some waters contained nitrates which also contained a trace of zinc, and whenever he had water with nitrates he had asked whether there was any iron pipe or galvanising connected with it. But he had laid little stress on that, since he had found that the same water contained sometimes none and sometimes a considerable quantity of nitrites.

The Conference then adjourned for luncheon.

On resuming, Mr. Naylor read a

REPORT ON THREE YEARS' EXPERIENCE OF CHLOROFORM-WATER AS A PRESERVATIVE.

By Jos. F. Burnett, F.C.S., Pharmaceutical Chemist.

After a few introductory sentences the author proceeded to say that for the keeping of various chemicals in solution, so as to be convenient in rapid dispensing, nothing that he had tried was so effective, and at the same time so free from objection, as chloroform-water. It is not needed for the solutions of inorganic substances, such as potassium bicarbonate, magnesium sulphate, potassium bromide, &c., which are kept in most dispensing establishments. The advantage is evident in the case of solutions of organic chemicals, which are prone to decompose, ferment, &c., through the presence of fungoid organisms. The following is a list of those which the author regularly keeps made, in each instance solution being effected by dissolving the substance in B.P. chloroform-water, and adjusting to the required strength by the final addition of more chloroform-water:—

Citric acid, 1 in 2.	Ammonium chloride, 1 in 4.
Potassium acetate, 1 in 2.	Ammonium bromide, 1 in 4.
Potassium citrate, 1 in 2.	Quinine sulphate, 1 in 10 (by the aid of a sufficiency of dilute sulphuric acid).
Citrate of iron and ammonia, 1 in 2.	
Sodium salicylate, 1 in 2.	

Never in any of these is there any fungoid growth, even though they are kept in the varying temperatures of summer and winter for months. Two mixtures which are of equal convenience—viz., powdered rhubarb and aromatic powder of chalk—rubbed down with chloroform-water (1 in 8) keep well. Mucilage of acacia, made with chloroform-water, keeps indefinitely. There can be no drawback to the use of chloroform-water as a preservative, for the addition of one or two drachms—or even an ounce or two—to a mixture cannot have any injurious effect on the patient. None of the medical men for whom the author dispenses object to the addition

The second class of substances which he preserves with chloroform is infusions, either B.P. strength or concentrated (1 to 3). Those with which he has experience are quassia, gentian (strength as B.P., but without orange and lemon), senega, and cascarrilla—all single and concentrated. Calumba, hnebu, and orange—in the concentrated strength only. The preservative action of chloroform is perfect in all these when concentrated, the chloroform being added to the strained infusion in the proportion of 1 drachm (fluid) to each 40 fl. oz., and dissolved by agitation. The aroma of these preparations when diluted is much more like the fresh infusion than concentrated preparations of wholesale-house manufacture, and in no case does the chloroform cause any deposit—an advantage over alcohol when the infusion contains mucilaginous matter. Some practitioners object to the use of concentrated infusions preserved with alcohol on this very account. With the infusions made B.P. strength, chloroform, in a less proportion than $\frac{1}{2}$ drachm to 40 oz., will not keep them at all, except, perhaps, cascarrilla, and, if they are required to be kept more than a week, they need rather more than that, unless alcohol be added as well. For instance, $\frac{1}{2}$ oz. of chloroform dissolved by agitation in 2 gallons of infusion of senega will not preserve it good for seven days; but the same quantity with 2 oz. of tincture of senega will keep the infusion a fortnight at least.

From these experiences Mr. Burnett infers that when

chloroform is employed as a preservative the liquid must be nearly saturated with it, otherwise it will not keep for any great length of time. In the case of single-strength infusions this is a disadvantage, as a dose of 1 or 2 oz., if saturated with chloroform, contains from 2 to 5 minims of chloroform, so that it becomes a medicinal, if not an injurious, dose.

In some instances the chloroform may remain undissolved at the bottom of the bottle, when it exerts its preservative influence (as *e.g.* in the case of solutions of potassium citrate and acetate); but care must be taken not to pour it out when the bottom of the bottle is reached or neared.

ANOTHER PAPER ON THE SAME SUBJECT.

By Harold Wyatt, jun., Pharmaceutical Chemist.

Mr. Wyatt's experience is much akin to Mr. Burnett's. Dispensing stock mixtures and solutions made with chloroform-water in the proportion of 1 in 4 in the case of inorganic salts, but quinine, morphine, and other alkaloid salts in chloroform-water alone, remain clear and devoid of fungoid growth under conditions which would necessitate the use of at least 25 per cent. of proof spirit for their proper preservation. The action was specially observable with an extract of ergot mixture containing solution of strychnine, which was kept concentrated, but did not keep four days free from mould and trimethylamine odour until chloroform-water was used to make it. With this it kept good for three months. The author then referred to Mr. H. W. Jones's paper on "Permanent Hypodermic Solutions," in *THE CHEMIST AND DRUGGIST* of June 21, 1890, wherein Mr. Jones showed how serviceable chloroform-water is as a preservative of such solutions, and Mr. Wyatt proceeded to state that fruit-juices keep very well with chloroform added in the proportion of 1 part in 600, the aroma being rather improved than otherwise by the addition, at any rate in the case of raspberry, lemon, and blackberry juices. A sample of raspberry juice was submitted, which was prepared by allowing the fruit to stand in a lightly-covered jar for about a week, during which time a slight fermentation was set up, the juice sinking clear and the aroma improving. Since July, 1886, the sample has in no way deteriorated. Chloroform is also a great success with essence of rennet, which when preserved with it never acquires the slightest unpleasant odour; but it has no effect on cucumber-juice, except when 1 to 4 of glycerine is added along with 1 part of chloroform in 600. It is also very good for aqueous solution of opium.

DISCUSSION.

The PRESIDENT said that these papers upon kindred subjects were very valuable contributions to pharmacy, and they were fortunate in having got one or two gentlemen there who, he knew, had had some experience in this matter. Mr. T. B. Groves some twelve or thirteen years ago gave them some remarks on chloroform-water—on the chemical action of it; and Dr. Symes many years ago spoke, or wrote, in the same direction. Chloroform-water, he must say, was a very valuable preservative. What dispensers could do at hospitals under the supervision of the medical gentleman in charge could not be done in everyday pharmacy without the sanction of the writer of the prescription; still, if chloroform-water were introduced to the medical profession as a preservative, he thought they would use it.

Mr. W. GOWEN CROSS said that his experience of chloroform as a preservative had extended over many years, but he had not made any careful or systematic investigation of it. He found it useful for mucilage, syrups liable to ferment, and in certain other cases, such as hypodermic solution of morphia; but in that case it had always been done with the sanction of the prescriber. He was satisfied that the use of chloroform would be some day greatly extended in this direction. One thing in its favour was that chloroform could be easily dissipated by slightly warming the substance if it were so desired.

Mr. LINFORD said he had had a little experience in the use of chloroform-water, and agreed in the main with the statement of the authors of the papers that it did preserve solutions—especially solutions of organic substances—from any tendency to fungoid growth. It was especially a preservative of alkaloids. He had lately been using chloroform in another direction. Most of those who made concentrated infusion of roses knew the difficulty of prevent-

ing it getting mouldy at the top. He had put it in a large bottle, and suspended in the neck of the bottle a piece of cotton-wool saturated with chloroform, afterwards bunging the bottle up, and he had found that it kept for months without going mouldy or becoming pectinous. He thought probably there might be many substances for which chloroform might be used in that way by simply preventing access of germs by killing them as they passed through. He noticed that someone recommended the putting of chloroform into bottles with fruit, and bottling them simply with the vapour of chloroform in them. He tested that with some few bottles of damsons, beginning with 20 minims, and going up to 30, 40, and 60 minims, and could only say that the whole of them kept perfectly well, and that in cooking there was no flavour of chloroform.

Dr. SYMES thoroughly supported the view of the usefulness of chloroform as a preservative. Some years ago, when he was more in the habit of making fluid extracts by percolation, or using a large quantity of fluid, he found it exceedingly useful to add chloroform to the bulk of the fluid solution, which was waiting its time for evaporating down, and it kept for some days, and the chloroform became dissipated during subsequent evaporation. Using pressure so much now, he had not the same opportunity lately as he used to have; but he could support the statement of Mr. Wyatt that it was extremely good for preserving essence of rennet.

Mr. GERRARD, as a hospital dispenser, said he had for some five or six years past used chloroform as an antiferment, and especially for infusion of quassia, which was very prone to decomposition. It retained the strength, and as soon as it was drawn off a proper proportion of chloroform was added to it for preservation. He prepared an emulsion of chloroform, adding to the chloroform-water just a few drops of tincture of senega, and shaking it; the chloroform was thus divided into an extremely fine state, and it was easily available then for solution in the infusion. He was rather surprised—he might be wrong—but he thought that it was stated in one of the papers that sodium salicylate solution 1 in 2 was preserved with chloroform. This solution he kept constantly in stock and used it in large quantities, and he never found decomposition in such proportion as 1 in 2. He had used chloroform as a preservative of meat juice, and found that it kept perfectly for several weeks. After keeping it about a month, it underwent some change. He had used it also for fresh meat peptones. Alcohol he thought prevented the absorption of the peptone, an objection which did not apply to chloroform. He had mentioned chloroform as a preservative to the doctors, and they received the suggestion with approval, being only too glad to find a substance at their disposal for the purpose.

Mr. COLLIER fully upheld what Mr. Gerrard had stated as regards the preservative power of chloroform. At Guy's Hospital it had been used a number of years, and was recommended by the medical men, especially in cases where it was desired to give medicine for some days to out-patients. It seemed to him that amongst many objections to the use of chloroform was the special dislike some individuals had to it. He found a large number of cases of that sort, and there were some people who could not bear to take chloroform, just in the same way that others could not bear to take peppermint.

Mr. CRIPPS said chloroform itself was liable to undergo decomposition in the light, hydrochloric acid and other pungent vapours being produced, and as he believed that this objection applied to chloroform-water, he thought that substances to which chloroform was added should be kept in the dark.

Mr. MARTINDALE had also tried chloroform at one time for preserving fruit. He confessed that he had not met with the greatest success. It preserved the fruit very well, but when the fruit—in this case damsons—was made into tarts, the flavour of the chloroform was so strong that the tarts could scarcely be eaten—in fact, the chloroform was not dissipated even when the fruit was cooked. Chloroform was very useful for preserving many decoctions and infusions. He found it best to dilute chloroform with double its volume of rectified spirit; this solution thrown into the aqueous fluid dissolved much more satisfactorily than by the emulsification that had been mentioned.

Mr. NAYLOR observed that he had been very much struck with the remark made by Mr. Cripps, as it was quite contrary to his experience that chloroform-water decomposed, and he would be glad if Mr. Cripps would give further information on the subject by referring them to any series of experiments of his own or others in confirmation of his statement. As far as he knew chloroform-water made from pure chloroform was stable.

Mr. SIEBOLD endorsed the opinion that the addition of a small quantity of alcohol to chloroform did away with the liability to decomposition.

Mr. CRIPPS said he was quite aware that a small quantity of alcohol would preserve chloroform, and, as regarded the fact that chloroform-water was more easily decomposed than chloroform, he could not give any definite chemical experiments of his own, nor could he recall those of others. On the other hand, he could not recall any that proved that chloroform-water itself was more stable than chloroform—that he always understood, and, in fact, had met with chloroform-water that had become acid. He had always understood such was the case, and he had heard that opinion from other pharmacists.

Mr. BRANSON said that if an excess of chloroform was put at the bottom of the bottle the water would keep indefinitely.

The PRESIDENT said they would find some statements on the subject made fifteen years ago by Professor Atfield.

Mr. GROVES recommended that in using chloroform for the preservation of fresh fruits the stopper of the bottle should be smeared with honey.

Mr. MARTINDALE observed that it was a curious fact that the action of chloroform in this way was essentially inhibitory—it was not germicidal—and if the contents were already infected the fungoid growth would proceed. It acted as an anæsthetic to the matter which passed in.

Mr. A. C. ABRAHAM had not been successful at all with it—it had not the least effect so far as he could observe.

The PRESIDENT said that as a patient he liked chloroform-water very much, and thought it very grateful.

Mr. GERRARD added that chloroform-water was very much used as a preservative for physiological specimens, in urine, and post-mortem fluids.

Mr. PARKINSON asked whether it preserved ordinary mucilage—in this it would be a most valuable thing. If there was one thing more than another that annoyed him, it was mucilage going rancid. He had tried a number of ways to rectify it, but without success.

Mr. NAYLOR said Mr. Burnett stated that mucilage of acacia made with chloroform-water kept indefinitely. He could confirm that statement from his own experience. He knew others who had also kept mucilage in the same way.

The PRESIDENT was sure they were all desirous of thanking the authors of the two papers. They were on very practical subjects, and would be studied with great advantage by pharmacists.

After this a paper was read on

GLYCERINE.

By J. Lewkowitsch, Ph.D., F.I.C., F.C.S.

The author stated that during the past year pharmacists had been considerably exercised regarding the contamination of glycerine with arsenic. It was a fact not unknown to the manufacturers that glycerine was apt to be so contaminated; but they did not think it necessary to arouse suspicion in the minds of purchasers. There was no difficulty whatever in making glycerine absolutely free from arsenic, for it was owing to the employment of reagents—such as sulphuric acid—containing arsenic that the contamination arose, so that if care was taken to employ pure reagents they could obviate the difficulty. It had been said, during the discussion on Mr. Siebold's paper last year, that by distillation one could get rid of the arsenic. Mr. Allen, however, did not commit himself to that opinion, but it was the general impression that it was so. He did not believe it, for this reason: Schiffé and Jackson had shown that arsenic combines with glycerine to form an ether having the formula $As_2O_3(C_2H_5)_2$, which is volatile, so that it would distil along with glycerine, and it was altogether impossible to remove arsenic from glycerine, so far as skill and knowledge went at present. The author himself had made no experiments to prove the presence of this arsenical ether, but he gave the

facts for what they are worth. He then proceeded to state how glycerine is made, dividing the processes into three groups—(1) The hydrolysis of fats by means of water, either as superheated steam or otherwise; (2) by saponification with lime; and (3) by hydrolysis with sulphuric acid. There was no difficulty in getting glycerine by the first and second methods free from arsenic; but all glycerine obtained from works where sulphuric acid is employed in its manufacture contains arsenic, and the glycerine from some other works in which the whole of the processes are used are also arsenical. Of ten samples which he had examined, those being obtained from the principal factories, only three were free from arsenic. Soap-les glycerine next came under the author's notice, and he remarked that it had been very badly treated at the last Conference, and speakers were very positive in their suggestions that such glycerine ought to be avoided, because it was assumed that soap-les glycerine could not be made free from arsenic. He did not hold this opinion, for during the past few weeks he had made experiments on a large scale, taking care in regard to the selection of the reagents, and he had succeeded in making the soap-les glycerine chemically pure and free from arsenic. Of these he exhibited specimens to the meeting, all being 1·260 or higher in gravity. Dr. Lewkowitsch proceeded to criticise the Pharmacopœia tests for glycerine. The absence of fatty acids ought, of course, to be ensured, but there was one contamination which was not usually provided for, namely, the presence of polyglycerols, which are substances having higher boiling-points than glycerine, and the presence of which might be detected by evaporating a weighed portion of the sample at 120° C., and weighing the residue. The following figures show the percentage of organic residue and mineral matter medicinally pure glycerine yields on analysis:—

Organic Residue		Ash		Organic Residue		Ash	
1.	0·0243	0·00603		5.	0·0371	0·0081	
2.	0·0327	0·0050		6.	0·0443	0·0066	
3. (a)	0·0328	0·0·40		7.	0·0738	0·0014	
(b)	0·0267	0·0102		8.	0·0751	0·0154	
4.	0·0360	0·0138		9.	0·0931	0·0306	

Speaking of the silver test, the author gave preference to the use of ammoniacal nitrate of silver, believing that nitrate of silver alone is too rigid a test, as some organic decomposition inevitably takes place in samples which were unquestionably of great purity. He then made a few remarks regarding the means of estimating glycerine in Pharmacopœial preparations, touching upon the oxidation method, whereby the glycerine is estimated as oxalic acid; and the acetene method, which depends upon the conversion of glycerine into acetene by boiling with glacial acetic acid and sodium acetate. None of these is suitable for pharmaceutical preparations, the presence of other organic bodies obviously vitiating the results. But the author held out some hope that the conversion of the glycerine into a bromide, C_2H_5Br , may result in a workable method suitable for pharmacists.

THE NEXT PAPER.

Mr. SIEBOLD, before reading his note, said he was not aware that anyone in last year's discussion made any positive statement to the effect that distillation would remove arsenic from glycerine. It was conjectured—and he himself expressed a supposition—that it might be so, but nothing more. Then as to the condemnation of soda-glycerine, or glycerine obtained as a by-product in the manufacture of soap—that only referred, so far as he could remember, to the glycerine as they met with it in commerce, and not to glycerine such as could be obtained by the use of chemically pure acids. What was condemned was the ordinary glycerine obtained in that way. Of course, if pure acids were used, and the use of anything containing arsenic were avoided in the manufacture of glycerine, it was hardly likely that there could be any arsenic in the product. They must introduce arsenic in some form, or the product would not contain it.

He then read his note, which was as follows:—It has already been pointed out that glycerine obtained as a by-product in the manufacture of soap is always more or less contaminated with arsenic, which emanates from the acids used in the process. Having convinced myself that re-distillation of the glycerine, even if several times repeated,

does not remove this impurity, I made a number of experiments with the object of ascertaining whether the purification can be effected in a simple and inexpensive manner, such as would adapt itself to the purposes of the manufacturer. I will not trouble this meeting with a record of unsuccessful experiments, but will confine myself to a description of a simple process answering all requirements. It is based on the well-known property of freshly precipitated ferric hydrate of removing arsenious acid from solutions by converting it into an insoluble compound. The ferric hydrate, after being well washed so as to remove all soluble salts, is added to the glycerine previously diluted with about half its volume of water. The mixture is digested at a slightly elevated temperature, with frequent stirring, after which it is allowed to stand till the next day, during which time it is occasionally agitated. It is then filtered and evaporated to the required specific gravity. I found the mixture to filter much quicker than I expected. The product is perfectly colourless and free from arsenic and iron, and also free from sulphur compounds. The glycerine I experimented with was a distilled preparation sold as pure, though it contained appreciable quantities of arsenic and sulphur compounds. The process involves very little trouble, and is as easily carried out on a large scale as it is in laboratory experiments. I find that the complete removal of arsenic and of sulphur compounds from glycerine may also be effected by a suitable treatment with potassium permanganate; but as this process involves the necessity of subsequent distillation, it appears to me more troublesome than the other.

DISCUSSION.

The PRESIDENT said they would be glad to hear any remarks upon the papers, and in the meantime he should like to hand Mr. Siebold a report of his speech on the subject last year, and also the remarks made at that time by Mr. Allen.

Dr. SYMES asked Mr. Siebold if he had tested the glycerine for traces of iron after using the oxide of iron process. As a matter of fact, he had some difficulty with a quantity of glycerine which, when taken from the carboys in which it was imported, was perfectly bright and colourless and free from arsenic, but which, when placed in a glass bottle, became in a week or two opalescent and showed signs of colour. He mentioned the matter to Mr. Conroy among others, and on examining it carefully it was found to contain traces of oxide of iron, which must have been in solution. Mr. Siebold's process for removing arsenic by oxide of iron was certainly a valuable one, but he should like to know whether the method was not liable to leave a trace of iron in the glycerine, which would prove exceedingly troublesome.

Mr. CONROY said that since Mr. Siebold read his paper on arsenic in glycerine last year pharmacists had been very exacting in the quality of the glycerine they bought, and wholesale dealers had had considerable trouble and anxiety in seeing that the glycerine they sold was free from arsenic. It was very difficult to obtain commercial glycerine absolutely free from arsenic, except of a certain make, which he would not mention. He knew of a case in which one manufacturer guaranteed his product, made from soap-les, to be free from arsenic; but, on being tested, arsenic was found in considerable quantity. The manufacturer wished to bind them to Marsh's test, which was quite as easy as Mr. Siebold's. In reference to Dr. Symes's remarks, he had hitherto laid the contamination spoken of upon the drums in which the glycerine was imported; but Mr. Siebold had that day thrown considerable light upon the matter. He had very little doubt the presence of iron was due to the treatment suggested by Mr. Siebold; at the same time the treatment was a very ingenious one, and he had no doubt manufacturers would be very thankful to Mr. Siebold for showing it to them. But the glycerine should be distilled afterwards to free it from iron, and, as showing the necessity of that, he related an incident which had occurred in his laboratory in making 8 gallons of glycerine of tannin, which became quite black owing to iron contamination.

Mr. ABRAHAM asked whether the glycerine which Dr. Symes spoke of was really pure.

Dr. SYMES said the glycerine he had referred to was

tested for the presence of arsenic and found to be pure. He communicated with the manufacturers in Germany, and they admitted that they had used an iron process for the purpose of removing arsenic.

Mr. WARD (Leeds) said he had never found the glycerine imported in cans made with pure tinplates to act upon tannic acid in the way described, but glycerine coming in drums, and preserved in these drums for any length of time, was very apt to be contaminated with iron. He had not the slightest doubt that glycerine acted towards the iron as a solvent, so that he should hardly think it was fair to say that, if they found iron in a sample of glycerine, it must be due to the oxide of iron process. He should be rather prepared to learn that the iron was derived from the drum. In many cases people who sent it here in drums told them it was not intended to be kept in them.

Mr. CONROY took it that if the glycerine took up iron from the drum it would act upon the hydrate of iron. He was very doubtful about that himself.

Mr. SIEBOLD, after reading the remarks made on the subject last year, adhered to his former statement that he had then merely expressed an opinion which he had since found to be erroneous. He had tested the glycerine after treatment with the oxide of iron, and found it to be free from iron, and pure. It did not produce any coloration with ammonium sulphide except the colour, which would be produced with distilled water. Further than that he did not go, because, although he considered that arsenic should not be in it, any iron that might remain after that test would not affect it much. But iron might be in two different conditions, and more easily soluble in one than in the other, and therefore the glycerine might take up the iron from the drum. The glycerine produced by his process was also free from sulphur compounds, and he did not think redistillation was necessary; but even if it were he should still say the process was one commending itself to the attention of the manufacturer. (Cheers.)

Mr. BRANSON said it had occurred to him that the action of glycerine on metallic iron might be due to the fatty acids in the glycerine.

The PRESIDENT asked Dr. Lewkowitsch, in replying, to state whether the density mentioned in the British Pharmacopœia of 1.250 might not be fairly increased to 1.260, which was now the recognised specific gravity of commercial glycerine.

Dr. LEWKOWITSCH said he had not great experience in it, but still he knew the trade could very well supply glycerine of the gravity of 1.260 chemically pure. One did not care to go beyond 1.260, because the glycerine got decolorised. They could hardly expect him to go into the discussion on manufacturing processes, because he was a manufacturer himself, and they need not care about the process of manufacture if they got the pure article. How certain brands were made nobody knew and nobody ought to know. (Laughter.) Glycerine had an enormous dissolving capacity, and would extract iron oxide out of charcoal. He thought pharmacists need not trouble to purify the glycerine for themselves, because manufacturers could do it much more cheaply. He hardly believed that glycerine would take up iron from the drums, because it was filled in a cold state, and was so viscid when cold that it would not dissolve the iron. It would require to be heated before it would dissolve the iron.

After the President had thanked the authors of these papers, Mr. Siebold made a verbal communication regarding the

ANTIDOTES OF STRYCHNINE.

In this he explained that he had taken 15-minim doses of liquor strychnine, sufficient to produce contraction of the terminal muscles, and had followed the doses, as soon as the symptoms appeared, and sometimes before, with doses of the various antidotes. Tannin in 10-grain doses was perfectly valueless. Charcoal in 1-oz doses did have some effect, but not much; whereas chloral hydrate and chloroform sufficed to entirely prevent the muscular contractions if taken in time; and injections of morphia were also useful. Mr. Siebold gave this information at considerable length.

DISCUSSION.

Mr. LINFORD said that some years ago a boy at a farmhouse swallowed something containing strychnine which had been put down to poison rats. He happened to be there a few minutes afterwards, and was appealed to. Looking only at the extremely opposite nature of the effects of tobacco and strychnine, he took 6 or 8 grains of tobacco, put some warm water on it, and gave it to the boy, with the result that he never had any strychnine rigours, and suffered no harm. If such a case should occur again, the first remedy he should apply as an antidote to strychnine was tobacco. He had also seen a painful case of the passage of gallstones alleviated by the administration of tobacco. He thought the medicinal effect of tobacco was not sufficiently known; they were so apt to enjoy their pipe that they forgot the other qualities of tobacco. (Laughter.)

Mr. GROVES said that some years ago he saved the life of a valuable dog by giving him chloral. Of course, it would be of no use giving such remedies when the poison got into the circulation. They must then adopt physiological remedies as precipitants of the alkaloid. Supposing it were taken in time, iodide of bismuth might be tried. Of course, the best precipitant was iodide of mercury.

Mr. GERRARD said they occasionally got cases of poisoning in the metropolitan hospitals. He remembered a case in which the charwoman of his dispensary found where the syrup was kept, and, in helping herself, took by mistake some Easton's syrup. Feeling the symptoms of strychnine poisoning, she walked into the corridor and fell down. It was impossible to administer emetics, and she was treated physiologically. In other cases in their institution it had always been the practice to use a physiological antidote. It was very rare to administer tannic acid. Where strychnine had been recently taken they could administer an emetic with very good effect. In one case, where a student swallowed a crystal of strychnine for the purpose of tasting it, he was given a dose of sulphate of zinc, and not the slightest action of strychnine-poisoning was observed.

The PRESIDENT suggested that the discussion was now taking ground that the Conference could not safely or profitably traverse, so the matter dropped, and the next subject was taken up, viz.—

MERCURO-CHLORIDE OF CAFFEINE.

By R. H. Davies, F.C.S., F.I.C.

Mr. Davies described a compound of mercuric chloride with caffeine, of the formula $C_8H_{10}N_4O_2 \cdot H_2Cl_2$, which is easily formed upon mixing aqueous solutions of the constituents. The formation of this body will serve, he suggested, as a confirmatory test for caffeine, as the delicacy of the reaction appears to be considerable. With a solution of caffeine of the strength of 1 in 1,000 abundant crystals are formed a short time after it has been mixed with a saturated solution of mercuric chloride. The reaction is shown by the citrate as well as by the alkaloid. The compound formed is much more soluble in water than in a solution containing excess of the mercury salt. Hence it is advisable to use a saturated solution of the latter when testing for caffeine by this means. The double chloride is also much more soluble in hot water than in cold, and much of it crystallises out from a hot solution on cooling, which fact furnishes a ready method of obtaining it in a pure form.

Mr. Davies indicated that the compound he described was identical with one mentioned in Watts' "Dictionary of Chemistry," but its production from aqueous solutions appeared to be new, and enabled the reaction to be readily utilised as a valuable confirmatory test for the presence of this alkaloid. He had made an analysis of the body and found it to yield caffeine 40.6 per cent., mercury 42.8 per cent., and chlorine 15.42 per cent., which agrees pretty closely with the above formula. Some fine specimens of the compound were exhibited, and the reaction was practically shown.

DISCUSSION.

The PRESIDENT said the paper was a very valuable one, but he could not quite follow the last part of the remarks, that mercuric chloride would precipitate the alkaloid from citrate of caffeine as well as from caffeine itself. He believed the citrate did not really exist as a stable chemical compound, but was nothing more than caffeine alkaloid.

Mr. MARTINDALE said that mercuric chloride threw down precipitates of most alkaloids, and he had worked with some of them years ago.

Mr. JOHN C. UMNEY stated that Mayer's solution does not precipitate caffeine from its solutions.

Mr. DAVIES agreed that the compound in caffeine citrate was not a definite one, but they had the two substances—caffeine and citrate of caffeine—which were both well known to pharmacists, and mercuric chloride would serve as much as a test for one as for the other. The compound was a distinctive one, and by many people caffeine was regarded as an alkaloid in the true sense of the word.

The next paper read gave the results of

A COMPARATIVE EXAMINATION OF THE TESTS FOR METHYLATED SPIRIT.

By E. J. Millard and A. C. Stark, Pharmaceutical Chemists.

When examining a newly-proposed test for the detection of methylated spirit, the authors were surprised to find no reliable data as to the limit of delicacy in any of the known tests, nor which of them was claimed to be most satisfactory. They therefore started the investigation with the idea of determining the relative reliability and delicacy of each, and at the same time ascertaining which was the most convenient and satisfactory for the use of pharmacists. An attempt was also made to inquire into the conditions resulting from the use of methylated spirit in manufacturing certain pharmaceutical preparations, but was not completed owing to want of time.

Methylated spirit was defined as consisting of the mixture of 1 part of wood spirit with 9 parts of spirits of wine. At one time the wood spirit was supplied for this purpose by the Inland Revenue authorities; but now they are satisfied with taking samples, which are first examined at Somerset House before using to methylate spirit. This examination was not considered highly satisfactory, as no special attention was paid to the presence, in fixed proportion, of the two ingredients which form the objects of all the tests.

The tests fall naturally into two groups—those depending on the presence of acetone, and those which are directed to products of the decomposition of methyl alcohol.

1. The test proposed by Professor Emerson Reynolds, depending on the presence of acetone, was tried upon samples of rectified spirit of pharmacopœial purity, containing respectively 5, 10, 20, and 50 per cent. of methylated spirit, which were taken to represent 0.5, 1, 2, and 5 per cent. of wood spirit. The same methylated spirit was used through the whole of the investigation. The process consists in distilling 50 c.c. from 200 c.c. of the sample, diluting the distillate with water, adding a little caustic potash, and gently warming. Solution of mercuric chloride is then carefully added, the precipitated hydrate re-dissolving on agitation, and the liquid, which must be kept alkaline throughout, is next filtered, evaporated slowly, and divided into two parts. One is briskly boiled, when, if acetone be present, a yellowish-white precipitate will be produced; the other is acidified strongly with acetic acid, when the production of a precipitate also denotes the presence of acetone.

The results obtained with this test showed that there was no appreciable difference between the 0.5-per-cent. solution and rectified spirit itself. An opalescence was produced by acetic acid on the 1-per-cent. solution, but no precipitate was obtained on boiling. Both precipitates were obtained with the 2-per-cent. solution, and, of course, very copious ones with the 5-per-cent. The authors considered that, as some reduction takes place with rectified spirit itself, the limit of delicacy in this test must be the smallest quantity producing both precipitates, which is 2 per cent. of wood spirit.

2. Cazeneuve's test depends upon the reducing action of acetone, but in this case on permanganate of potassium. A modification of the test was suggested, whereby a smaller quantity of liquid was operated upon, and the length of time which occurred before the purple colour was changed to red, and also the production of a precipitate, were carefully observed. By a comparative table it was shown that this test was capable of detecting 0.5 per cent. of wood spirit with ease, and even smaller quantities, if no disturbing ingredients were present.

3. The test proposed by MM. Riche and Bardy belongs to

the second group, as it depends on the presence of methyl alcohol, from which methyl-aniline violet, by a series of reactions, is ultimately formed. Considerable attention had been paid to this test, as it is the one employed at Somerset House, and practical hints were given so as to obtain the best results. The use of white floss silk, instead of the wool recommended by Riche and Bardy, for ascertaining the tint of the dye, was strongly preferred. Methylated spirit was found to answer just as well as the alcohol mentioned in the text of the process. The opinion of the authors, after a large number of comparative examinations, was in favour of the test, in distinguishing beyond a shadow of a doubt, the presence of 2 per cent. of wood spirit, no matter what other interfering substance might be present. The difference of tint between 1 per cent., 0.5 per cent., and that of rectified spirit, whilst noticeable to a trained eye, was not so great as to allow of its being enthusiastically recommended. The most serious objection, however, was to the tediousness of the operation, two days being practically consumed—as ten hours' drying by water-bath at 90° C. is a part of the process.

4. The test proposed by J. T. Miller depends upon the production of formic acid by the oxidation of methyl alcohol. The formic acid, obtained by distilling a mixture of the alcohol, bichromate of potassium, and diluted sulphuric acid, is neutralised with sodium carbonate, and the reducing

or complete substitution for wood spirit for methylating alcohol being introduced before long. By the Spirits Act of 1880 only wood spirit could be used for the purpose of denaturing alcohol; but this last session an Act came into force which contains the following: "that the substance mixed with spirits for the purpose of methylation may be any combination of substances approved for the purpose by the Commissioners."

The principal denaturing agent which had been recommended as a partial substitute for wood spirit was pyridine. It has been for some time employed for this purpose in Germany, where the methylated spirit contains 2 per cent. of wood spirit and 0.5 per cent. of pyridine; also in Switzerland and Austria. A sample of this form of methylated alcohol was exhibited, and the opinion expressed that the alteration would be prejudicial to the legitimate uses of methylated spirit in pharmacy, owing to the high boiling-point and poisonous nature of pyridine.

DISCUSSION.

Mr. NAYLOR said the writers of the paper had informed him that this was really a first instalment only.

The PRESIDENT said that tubes and wools showing the colours had been sent for inspection, and these were passed round the meeting.



YORKSHIRE COLLEGE.

action tried upon nitrate of silver. The limit of the test with certainty is the production of the well-known mirror reaction, and this is not obtained with solutions containing less than 2 per cent. of wood spirit. Reduction of silver and the production of a dark precipitate is noticed with 0.5-per-cent. solutions, and even less, but, as rectified spirit itself does this, the limit must be placed at 2 per cent.

5. Hehner's test ("Year-book of Pharmacy," 1888, p. 114) also depends upon the reducing action of oxidised methyl alcohol, and is estimated by ascertaining the amount of standard bichromate solution which a definite quantity of the methyl alcohol reduces in two hours at 100° C. The experiments with this test were not finished, but the length of time employed in the process is materially against it. In summarising their results, the authors speak most highly of Cazeneuve's test, which is easy, expeditious, reliable, and delicate. Their only objection is one that applies to all the tests—viz., it depends upon the presence of a body not invariable in its proportion in wood spirit itself.

The remaining portion of the paper contained a criticism upon the remarks of Mr. F. W. Fletcher, in this journal, on the withdrawal of the permission to use methylated spirit in the production of certain pharmaceutical preparations, from which afterwards it is removed by heat. In conclusion, special attention was drawn to the possibility of a partial

Mr. LINFORD said that the test given by the Dutch Pharmacopœia for detecting methylated spirit in sweet spirit of nitre was a most valuable one. It depended upon the formation of iodoform, and, as showing its delicacy, he mentioned that he had added to B.P. spirit of nitre 5 per cent. of a spirit of nitre made with methylated spirit, and he had detected the addition without difficulty; so that the test was one which ought to be better known.

The PRESIDENT said as a chemical fact it was well worth knowing this test, and he was sure the authorities of Somerset House would be glad to know it, because they were always glad to hear of anything that would be a loss of revenue to them.

This finished the programme set out for Tuesday.

VISIT TO THE YORKSHIRE COLLEGE.

At the conclusion of the proceedings most of the members—a considerable contingent having gone to watch the cricket match between the Australians and the North of England—walked up to the Yorkshire College, where a reception was given by Principal Bodington and the other professors. The reception commenced at 5 o'clock, and Principal Bodington, with Mr. Richard Reynolds, who is a member of the College Council, were kept busy shaking

hands with ladies and gentlemen until half-past five. The reception, we may state, took place in the main chemical laboratory, a most magnificent hall, fitted with careful completeness, and containing almost every conceivable convenience for carrying on the ordinary experimental work of chemistry. As soon as Principal Bodington could get a chance he addressed those assembled in a few words of welcome, stating that he and his colleagues thought it better not to make the proceedings formal, but rather to throw the whole of the departments open for inspection, and he invited them to take a walk round, and they would find a gentleman in each department who would give any information that was desired.

We may state here that the College was founded in 1874 under the name of the "Yorkshire College of Science," and the work was carried on in temporary buildings in Cookridge Street. In 1877 arts was added to the subjects taught, and the title was abbreviated to "Yorkshire College." In 1885 the College removed to its present site, the new buildings being inaugurated by the Prince and Princess of Wales. The Leeds School of Medicine, which was established in 1831, was amalgamated with the College in 1884, and in 1887 the College was admitted as one of the three constituent colleges of the Victoria University.

The Yorkshire College now offers courses of training for degrees in arts, science, medicine, and surgery, taking in civil, mechanical, and electrical engineering, coal mining, analytical chemistry, and the manufacture, dyeing, and printing of cloth and other textile fabrics. There are day and evening classes. The teaching staff consists of sixteen professors, eighteen lecturers, and nineteen assistant lecturers, demonstrators, and teaching-assistants. The day students number 460, and there are 513 evening students, the fees collected amounting to more than 7,000%.

The College grounds extend to 3½ acres, but this is not all occupied in buildings, the whole scheme not yet being complete, for the erection of a central hall and a library is on the point of being undertaken.

The medical department of the College is in Park Street, near the General Infirmary.

It would be impossible to give an adequate conception in a brief report of the very complete character of this institution. Wisely, we think, the Council confine their efforts to those branches of science and technical training which are most appropriate for the local industries, hence chemistry is, if anything, the chief subject, and related to it the dyeing department deserves to rank next in importance. Engineering and textile industries are also well looked after. We have already stated that the chemical laboratory is especially handsome, but the laboratories for the prosecution of experiments in dyeing are perhaps equipped still more handsomely. In several of these were shown most interesting collections of dyed fabrics, one comprising specimens of calico prints manufactured in the first half of the present century, and including, therefore, colours only of vegetable and animal origin. In another department we noticed a somewhat unique book of specimens, showing the influence of sunlight and chemical reagents upon dyes of specific composition; for instance, one could see how cochineal and stannous chloride dye appeared after one, two, and six months' exposure to light; how it was affected by boiling with soap, by treatment with acid, and so on. Altogether this dyeing department is one of which we could say much, and we were glad to hear that the effect of the education provided at the institution is having good influence on local industries. Considerable interest was taken by the visitors in the various lecture-rooms, especially the chemical one, which is very handsomely provided with facilities for aiding the lecturer in showing diagrams, lantern pictures, and in demonstrating chemical operations which require to be conducted in closed chambers. We may say that nearly all the arrangements in this lecture-room were devised by Professor T. E. Thorpe, who was Professor Smithell's predecessor in the chair of chemistry. Tea was served in one of the rooms of the building, and altogether the visitors spent a most enjoyable hour at the college.

Wednesday, September 3.

The President, in opening the proceedings on Wednesday morning, said he was desirous of

REPAIRING AN OMISSION

that they made on Tuesday, in reference to the report of the Executive Committee and the financial statement, which were not adopted. He should be very glad if two gentlemen would kindly undertake to move and second their adoption and publication in the Transactions.

Mr. WARD (Sheffield) moved the adoption of the report and statement. It was, he said, highly gratifying to find that they were in this satisfactory condition financially. It was to him an amazing fact that the Conference was conducted so economically and yet so efficiently.

Mr. WEST (Bradford) seconded the motion, and thought more applications should be made for funds for conducting researches.

The PRESIDENT was sure the Executive were anxious to apply the funds for the purpose named if applicants would make use of them.

The motion was carried.

DELEGATES.

The PRESIDENT asked if there were any delegates present whose names had not been given on Tuesday. There being no reply, he said he was told that they had in the room Mr. W. S. Evans, of New York, a Canadian pharmacist. If that were so, they were glad to welcome him, although he might not be a deputy from any pharmaceutical body. (Cheers.)

Mr. S. M. BURROUGHS said Mr. Evans did not happen to be in the room then, but he should have pleasure in conveying the welcome to him.

THE BARK OF OROXYLUM INDICUM.

By E. M. Holmes, F.L.S.

Mr. Naylor, hon. sec., read a few extracts from this paper, in which the author stated that Dr. Dymock had sent him some time ago a number of drugs for chemical analysis, and amongst them was the bark of *Oroxylum indicum*, a Bignonea which is much used in India for the treatment of rheumatic swellings, &c. Dr. Dymock had used it in twenty-five cases with good results. It is also used in veterinary practice for treating the sore backs of bullocks.

It will be advantageous to introduce here a few notes on this bark which we have in type.

The plant which yields the bark is better known under its old name of *Calosanthes indica* (Bignoniaceæ), which grows throughout India, from the Himalayas to Ceylon and Malacca, not in the western drier area, but in the Terai west to the Chenab. The tree is a fast grower, and attains a height of from 25 to 40 feet.

The bark is about ½ inch thick, light brownish grey, soft, and yields a green juice when cut. The leaves are 4 to 5 feet in diameter, ternately bipinnate. The tree is noted for its long, terminal racemes of large white or purplish flowers, which appear at the commencement of the rainy season. These flowers are succeeded by long, flat, woody capsules, sometimes 3 feet long by 2 to 3½ inches wide, and about ½ inch thick, slightly curved and somewhat convex on one side and concave on the other. They dehisce by a suture all round the edges, and contain numerous flat seeds, with broad, delicate membranaceous wings. These long, woody fruits often remain on the trees for months. Gamble says the seeds are used to line hats, and are placed between two layers of wickerwork to make umbrellas; they may also be seen in Buddhist temples in Sikkim hung up in strings, or made into ornaments to suspend from the roof. The bark and fruit are used in tanning and dyeing. Dymock states that the bark is of considerable importance in Hindu medicine, it being one of the ten which formed the ingredients in the compound decoction known as "Dasamula," so often referred to in Sanscrit works. It is considered in India to be astringent and tonic, and to be valuable in diarrhoea and dysentery. The juice expressed from the roasted bark mixed with "mocuem"—the gum of *Bombax malabaricum*—is also used as a remedy in diarrhoea and dysentery. In Bombay it is used in veterinary practice, usually mixed with turmeric, as an application to the sore backs of bullocks. Dr. Evans gives his experience as follows: "I have made a trial of the powder and an infusion of the

bark, and have found it to be most powerfully diaphoretic. The drug has slight anodyne properties; also a bath, prepared with the bark, I have frequently employed in rheumatism. Twenty-eight cases of acute rheumatism were treated with this drug, and in all the results have been most satisfactory. The dose of the powder is from 5 to 15 grains thrice daily; of the infusion (1 oz. of bark to 10 oz. of boiling water), 1 oz. three times a day, combined with opium. It forms a much more powerful sudorific than the compound powder of ipecacuanha. The drug does not possess any febrifugal properties." A full description of the bark is given by Dymock, in the course of which he states that if a section of it be placed under the microscope in a little water the whole field is seen to be filled with delicate needle-shaped crystals. The bark is faintly bitter and a little acid; it has no particular odour.

CHEMICAL EXAMINATION OF THE BARK.

By W. A. H. Naylor, F.I.C., F.C.S., and E. M. Chaplin, F.C.S.

The comminuted bark was percolated successively with petroleum spirit, ether, absolute alcohol, and water, in the order here stated, and the extracts obtained from the different percolates examined.

The petroleum-spirit extract was of a fatty nature. By treatment with suitable solvents—proof spirit, ether, and benzol—it was divided into three distinct proximate principles:—(a) Greenish-brown crystalline fat. (b) vegetable wax, (c) crystalline acrid principle having the properties of a fat-acid. To this last-named body the acidity recognised on chewing the bark is due.

The ethereal residue was composed chiefly of a crystalline substance, the remainder being fatty matter. By treatment to exhaustion with boiling petroleum spirit all trace of fat was removed. The insoluble residue was ultimately obtained in a pure condition by crystallising from boiling proof spirit, the operation being several times repeated. The final crop of crystals was of a golden-yellow colour, acicular, about $\frac{1}{8}$ inch in length, and melted at 228.5° – 229° C. They dissolved readily in alcohol, ether, and warm glacial acetic acid. Benzol dissolved them sparingly, while water exerted no solvent action upon them. A single crystal when brought into contact with a weak solution of sodium, potassium, or ammonium hydrates assumes a cherry-red colour, which quickly changes to brick-red, and gradually passes into olive-green. A solution of this body in proof spirit rapidly reduces nitrate of silver, and immediately decolorises permanganate of potassium. Neutral and basic plumbic acetates, cupric acetate, mercuric and ferric chlorides, and calcic hydrate also give characteristic precipitates when added to its solution in proof spirit. It refused to hydrolyse when subjected to the prolonged action at boiling temperature of a 10-per-cent. solution of sulphuric acid. The authors remark that this interesting substance is being submitted to a more detailed examination, and they hope to publish shortly particulars respecting its nature and composition. Meanwhile they propose to designate it "oroxylin."

The alcoholic extract was treated with proof spirit in the cold, when the larger portion passed into solution. That which did not dissolve proved to be, when purified, oroxylidin. The soluble portion, after evaporation to dryness and dissolution in water, was precipitated with neutral plumbic acetate, the resulting precipitate being suspended in water and decomposed with sulphuretted hydrogen and filtered. The residue left after evaporation of the filtrate was dissolved in a little water, and the pectinous substances present thrown out with strong alcohol. The alcohol after decantation and evaporation yielded a scaly residue, astringent to the taste, the aqueous solution of which gave a bluish-black precipitate with ferric chloride, reduced Fehling's solution, and differed from the tannins proper by not precipitating a solution of gelatine. The liquor from the neutral plumbic acetate was precipitated with basic acetate and filtered. The filtrate when freed from lead left, after evaporation, a thick brown syrup, which reduced Fehling's solution abundantly, while its aqueous solution was precipitated by alcohol. In general it exhibited the characters of a sugar.

The aqueous extract yielded but little of interest chemically, the only crystalline body separated being citric acid. It also contained a large proportion of extractive matter,

which was completely thrown down by basic plumbic acetate, but was not precipitable by neutral plumbic acetate. The aqueous extract not precipitable by neutral or basic plumbic acetates consisted most largely of the sugar already referred to.

It therefore appears from the examination of this bark that it contains the following proximate principles:—(1) Crystalline fat, (2) wax, (3) acrid principle, (4) oroxylin, (5) chlorophyll, (6) pectinous substances, (7) Fehling reducing substance, (8) astringent principle, (9) citric acid, (10) extractive matter.

DISCUSSION.

The PRESIDENT hardly expected the papers to be discussed; but they represented a great amount of work. (Cheers.) He had no doubt many of them would study the papers when they appeared in print, and in the meantime, if anyone had any remarks to make upon them, he should be glad to hear him.

Mr. T. B. GROVES did not quite understand from the reading of the papers what class of bodies the oroxylin belonged to. Had Mr. Naylor identified it sufficiently to classify it?

Mr. NAYLOR replied that it appeared to have many of the characteristics of a ketone derivative. They had gone so far as to treat it with zinc dust, but were not altogether satisfied with the results at present, and they had deferred this part for more particular examination.

Mr. GROVES: Do you mean the active principle?

Mr. NAYLOR: Well, we are inclined to think it is.

Mr. MACEWAN said he understood the bark had an acid as well as an acrid taste. Did Mr. Naylor attribute the acidity to the citric acid?

Mr. NAYLOR replied that he was scarcely able to say. The bark did not appear to him to have a particularly acid taste. Certainly they found a small amount of citric acid, but were not inclined to lay much stress on the acid. He was rather inclined to think, as far as the chemical examination had gone, that too much stress was laid upon the acidity.

Mr. MACEWAN said that it might be more acid in the fresh condition.

The next paper read was on

HYDRARGYRI IODIDUM VIRIDE.

By W. Martindale, F.C.S., and W. Appleton Salter.

In this paper the authors described a number of experiments made for the purpose of determining how this salt can be made so as to be of greater stability than the one which was removed from the British Pharmacopœia. They found that a sample of the salt supplied to them, which kept better than any others, contained a considerable percentage of free mercury, and reference showed that the French Codex and the United States Pharmacopœia both prescribe an excess of mercury. It so happens that in France and America mercurous iodide is more extensively used than in any other country. The authors then proceeded to speak of the decomposition which occurs in the salt, mentioning different theories which have been given from time to time regarding it, and they stated that they were not favourable to the yellow iodide, although some authorities give this the preference. They had made no experiments to prove that the precipitated iodide is more or less unstable, contenting themselves with the statement that the fact is generally accepted that the yellow iodide does change to the red more rapidly than the green. It would seem, however, that most of the assertions regarding the oxidation of the green salt are much exaggerated, as the following results of analysis show:—

	HgI ₂	Hg ₂ I ₂		HgI ₂	Hg ₂ I ₂
A	0.1 per cent.	81.6 per cent.	D	0.26 per cent.	66.65 per cent.
B	0.24 "	83.07 "	E	0.34 "	85.75 "
C	0.2 "	91.62 "			

The red iodide was separated with ether, and the green by solution in acid, precipitation as silver iodide, and weighing. Several of the specimens contained much free mercury, D having no less than 30 per cent. They therefore recommended that one-fourth more mercury should be used than was theoretically necessary, and that the iodine should be added gradually, while the two elements are moistened with spirit and well triturated: this yields a preparation well suited for medicinal use. The preparation contains 13.2 per cent. of

free mercury, and keeps green when stored in amber-coloured bottles in the dark. The prescribers whom the authors had to deal with insisted upon having a green salt, and ordered it in $\frac{1}{2}$ -grain doses. The pills are best made with sugar of milk, gum, and syrup. Finally the authors quoted the opinions of Drs. Buxton Brown and Campbell Williams, which were entirely in favour of the salt prepared as suggested.

DISCUSSION.

Mr. A. C. ABRAHAM said the green iodide of mercury was in regular demand, and why it should be omitted from the Pharmacopœia seemed rather difficult to comprehend. He thought the fact that it had varied in composition was the very best reason for keeping it in the Pharmacopœia, and thereby giving them a definite compound. If Mr. Martindale could show that by using excess of mercury this constant composition could be obtained it would be a valuable thing. He thought that the preparation was brought into prominence originally in the Dublin Pharmacopœia, and it was there ordered to be made with absolute alcohol, and not rectified spirit. His father was always careful to use absolute alcohol, and its use had this advantage—that the preparation dried during trituration, and no further drying was necessary. Had Mr. Martindale tried absolute alcohol?

Mr. GERBARD asked Mr. Martindale the length of his experience with reference to the keeping properties of this preparation.

Mr. CRIPPS said the table Mr. Martindale had given indicated that the iodide was not so easily oxidised as they had been apt to assume. He asked whether, after the pills were made, there was any oxidation. He found one of the pills sent round was rather yellow inside.

Dr. SYMES supported the statement that mercurous iodide was very largely prescribed, and further stated that the medical men who prescribed it did get very satisfactory results from it, and he considered that a reason why it should not be omitted from the Pharmacopœia. If they had a preparation that was more or less suitable, its removal from the Pharmacopœia was not likely to make it more definite or to give them a more uniform product. He agreed that the preparation should be made in small quantities, and it should be excluded from air and light as much as possible. He remembered that in trying to wash the mercuric iodide out of the salt with ether one seemed almost able to go on washing for ever without getting rid of the iodide. It formed as they went along. So long as they could get a preparation such as Mr. Martindale described, it was very desirable to recognise it by having it in the Pharmacopœia. (Cheers.)

Mr. GROVES was surprised to hear of the small dose that was given—one-sixth of a grain, for one would rather think the salt had some relation to calomel, and could be given in larger doses. That led him to ask the question—what became of the mercurous iodide after it got into the stomach, and what was its action on the digestive organs? Was it changed there into red iodide?

The PRESIDENT said Mr. Martindale had made some remarks in reference to what he (the President) had said in his address as to the use of green iodide of mercury and grey powder. Now, in his experience, these preparations were very much less used than formerly. Mr. Abraham asked why this preparation had been left out of the Pharmacopœia. He thought it was left out for the best of all reasons—that it was an unstable preparation. He thought what Mr. Martindale had shown them pointed very strongly to the conclusion that it was a very unstable preparation. Mr. Martindale, he thought, used the words, "it is too pure to be stable." Then Dr. Symes told them that even whilst they were washing it the mercuric iodide was being formed. It could not be a reliable preparation to put into the hands of the physician, because, although mercurous iodide was not a very potent preparation, mercuric iodide was a very dangerous preparation. He must stand up for the Pharmacopœia editors, and say they had a very good reason for omitting the green iodide of mercury, or, as it was more properly described, the yellow iodide of mercury. The German Pharmacopœia used to describe it as yellow. Mr. Wood's paper, read to the Conference some fifteen or sixteen years ago, showed that the preparation sometimes contained as much as 28 per cent. of mercuric iodide—although he

was bound to say Mr. Wood showed how it could be prepared to contain a very small quantity of mercuric iodide. Upon the discussion and experiments that followed that paper Professor Redwood reported that the Pharmacopœia should leave out green iodide of mercury from further editions; and he (the President) thought better reasons would have to be shown before it was reinstated. The Germans had also omitted it from their Pharmacopœia. They were exceedingly indebted to Mr. Martindale for bringing this matter forward, because the fact remained that green iodide was prescribed still, and so was grey powder. Why had grey powder got into such bad repute? Simply because it was an uncertain preparation, being sometimes of one strength and sometimes of another, and changed by keeping so as to become almost poisonous in certain cases. It was prescribed for children much less than formerly.

Dr. SYMES said that green iodide of mercury was largely prescribed, and they dispensed it more largely now than they did seven years ago. Its use had absolutely increased, and under these circumstances they had to assume that the medical profession found it desirable to prescribe it and got the results they desired. Under these circumstances it became their duty to give physicians the best preparation they could. As he understood the President, his rule seemed to be that the preparation should be left out of the Pharmacopœia, and thereby rendered less definite, rather than included with a fairly good process for preparing it.

The PRESIDENT said he had already spoken on that point and would leave it to Mr. Martindale to deal with.

Mr. SCHACHT said there was no doubt in his mind that the aim of the pharmacist should be to produce the purest article he could. But he could not help thinking that now and then they might stretch that principle a trifle too far and deprive themselves and others of the use of valuable remedies because they were not absolutely pure. They scarcely ever found a pure article in nature, and it was a fact well known to them, that if two pure elements were placed together they would not react. For example, pure zinc was not acted on by pure sulphuric acid; and he had been told that they could distil phosphorus in perfectly pure oxygen. If it were the fact that there was special difficulty in the interaction of absolutely pure elements—that it required a minute proportion of a foreign body to bring action about, there was a possibility that mixtures of drugs which were not in a state of absolute purity might have a useful action when introduced into the human body. Of course he was not arguing on behalf of impurity.

Mr. BRANSON said that if the mercurous iodide was not in a fit state to dispense, it could very soon be made so. He agreed that mercuric iodide was constantly re-formed if the preparation were left a week or two.

Mr. KINNINMONT did not think it mattered much whether the preparation were admitted to the Pharmacopœia or not so long as it was in Mr. Martindale's little book. Physicians looked upon the latter as of more importance than the Pharmacopœia. They had been bothered for years with the question whether the preparation should be green or yellow. He had been careful to have it prepared with excess of mercury, and have it greenish rather than yellow. It was not easy to convince medical men that it was not a definite compound. He remembered when he was young he pointed out to a medical man that a decomposition had taken place in the remedies he was prescribing. He replied, "I daresay you are right, but I always find that powder answer the purpose." That was an answer; it was not a chemical compound that they wanted to produce, but something that would have a therapeutical effect. He corroborated the statement of Dr. Symes that the preparation could easily be got into the mercuric iodide state.

Mr. ABRAHAM asked whether instability of a number of preparations, such as blue pills and mercurial ointment, would lead them to exclude them from the Pharmacopœia.

Mr. CONROX agreed that the use of absolute alcohol gave a much better result in making the green iodide than rectified spirit. If the preparation were kept in the dark it would keep for some time fairly well. The best mode of making the grey powder was to put the two ingredients together in a bottle and shake them together. By that process they got a much better result.

Mr. WARD (Leeds) said that in many towns the green

iodide was very extensively used in the treatment of cutaneous disease in dogs, and those who wanted it always insisted that the green colour should be stable.

Mr. BOTTLE said that, according to his experience, green iodide of mercury had very much gone into disuse. He rejoiced that it had done so, because it was so unstable. They must bear in mind that dispensing was not all done in West-end establishments; in country places they had occasion sometimes to dispense green iodide of mercury a few times a year. Was the pharmacist called upon to make his preparation each time he wanted it, in order to have it in good condition? He mentioned an instance of grey powder (sent to India) having changed so much by keeping that it nearly poisoned the children to whom it was administered. He wanted to exclude from the Pharmacopœia preparations that did injuriously deteriorate the moment after they were made.

Mr. MACEWAN said there was one point which should not be overlooked in a discussion regarding mercury compounds—that was that they had passed the days of heroic medication, when mercury was administered in $\frac{1}{2}$ -lb. doses, and salts of mercury in such quantities that the skeletons of patients who had been treated with them were so saturated that the mercury could be shaken from the bones. That was what tradition said, at any rate. Grey powder had undoubtedly in many cases caused peculiar results on children; but that was for the simple reason that they had continued to give the dose that their forefathers gave—2, 3, 4, and 5 grains at a time. But enlightened physicians now found that a dose of $\frac{1}{4}$ or $\frac{1}{2}$ grain produced far happier results than the old-fashioned doses he had named. Mr. Martindale had found that 2 and 3 grain doses of green iodide of mercury were no longer prescribed, but only fractions of a grain. Why should larger doses be given when smaller ones would suffice? That was a side of the question which should have some consideration on the part of the compilers of the Pharmacopœia.

Mr. MARTINDALE, in reply, said he had not tried absolute alcohol, as Mr. Abraham recommended; but it was necessary to use some alcohol, and not allow the action to be too intense. He had no doubt that absolute alcohol would be better than rectified spirit. As regards the keeping of the preparation, he pointed out that sample A was prepared in 1887, and was found to contain only $\frac{1}{10}$ per cent. of mercuric iodide. The difference between that and the other preparations was not much. It might be kept of a uniform green colour without difficulty. In reply to Mr. Cripps, he said that exposure to light did have the effect of reducing the iodide on the surface of the pill. The preparation was in large and constant demand, and, although unstable, it was useful. Were they to condemn a thing because it happened to be slightly unstable? He could not offer an opinion on the physiological action of the preparation; but he called attention to Dr. Broadbent's statements at Birmingham as to its action in syphilis, which nobody understood. The preparation was largely used in France and America, and if it were not procurable in this country it would be supplied by foreigners. True mercurous iodide might be either yellow or green—he did not know which.

The PRESIDENT announced the next paper as

ON CREAM OF TARTAR.

By H. Broadbent, A.I.C., F.C.S.

My inability, said the author, to find any published results on this article of more recent date than ten years ago, when Mr. Allen was finding as much as 12 and 14 per cent. of calcium tartrate in cream of tartar, and that it was being systematically adulterated with heavy spar, as well as my desire to have, if possible, a recognised standard for this article, induced me to lay these results before the Conference. I thought it would be useful and interesting to give the members of this Conference the results of the examination of a great number of samples, which have passed through my hands during the last few years.

Cream of tartar, as we all know, consists essentially of acid potassium tartrate—in fact, it is a B.P. synonym of that article; but with this is always found a little neutral tartrate of potassium, also calcium tartrate, besides a little insoluble matter and moisture.

In the market there are three or four varieties of cream of tartar, known respectively by the names of the countries

which produce them; thus we have Italian, French, German, and Spanish, the process of manufacture being very similar in each case—viz. by crystallisation and removal of impurities from crude tartar, or argols, which are deposited in a crystalline mass during the fermentation of grape-juice. The analysis of cream of tartar presents no difficulties. The following is the method used in all these determinations: The insoluble matter and moisture were estimated in the usual manner; the acid potassium tartrate was estimated by direct titration with decinormal soda solution, using phenolphthalein as an indicator. The normal tartrates of potassium and calcium were found by incinerating a weighed quantity in a platinum crucible at a very low heat, care being taken to obtain complete combustion of the carbon without causing the loss of any alkali. The mixed carbonates of potassium and calcium were then boiled with water, filtered from the insoluble calcium carbonate, which was washed, dried, and weighed. From the weight of the carbonate we can easily get its equivalent of tartrate.

To the filtrate from the calcium carbonate was added an excess of decinormal sulphuric acid, the mixture boiled, and this excess of acid estimated by titration with decinormal soda solution; from this we get the amount of sulphuric acid neutralised by the potassium carbonate formed both from the acid potassium tartrate and from the neutral potassium tartrate, and having found the amount of acid potassium tartrate in the sample, the difference of these two gives us the neutral potassium tartrate.

Early in this year I published in THE CHEMIST AND DRUGGIST the results of my work on about forty samples of Italian cream of tartar, and showed that the present average composition is:—

	Per cent.
Acid potassium tartrate	94.11
Neutral „	1.52
Calcium tartrate	4.32
Insoluble matter	0.23
Moisture	0.27

I have not had anything like this number of samples of French cream of tartar, but from six analyses get the following average, and the same remark applies to German cream of tartar:—

	French	German
	Per cent.	Per cent.
Acid potassium tartrate	93.00	93.05
Neutral „	1.73	1.45
Calcium tartrate	4.78	5.00
Insoluble matter	0.23	0.25
Moisture	0.30	0.32

Of Spanish cream of tartar I have only come across one sample, and thus cannot give an average; but this one gave similar results to those given above. Thus we see that cream of tartar, as we now find it in trade, whether it comes from Italy, France, or Germany, has a somewhat definite composition, and, if that be so, we are in a position to settle the question of how much calcium tartrate is allowable in a good sample of cream of tartar.

Squire, in the latest addition to the "Companion," says there is from 2 to 3 per cent. in even good samples; whilst Allen, in his "Commercial Organic Analysis," says that the amount varies from 2 to 9 per cent., and any proportion present in excess of 10 per cent. may be considered as an adulterant; whilst the United States Pharmacopœia limits the quantity to 6 per cent. From the above analyses I am of the opinion that this last amount is a very fair limit, and think it would be an improvement in our own Pharmacopœia if the amount of calcium tartrate allowable was definitely stated, and for my own part should limit it to 6 per cent. This would give a fair margin, and, if we allow 1 per cent. for moisture and insoluble matter—which is more than sufficient—it only leaves us with 93 per cent. for the two tartrates of potassium, which, according to my analysis, will be a standard to which the manufacturers can easily attain. If these or some similar standards should be adopted, it would be infinitely better than the present statement about the presence of lime in cream of tartar, and would remove, at all events from one article, that ambiguity, preventable or otherwise, which often surrounds the quantitative tests of the British Pharmacopœia.

DISCUSSION.

The PRESIDENT said this was an important matter, as pharmacists were sometimes confronted by magistrates and other authorities and public analysts on the question as to what was pure cream of tartar. The figures put on the board by Mr. Broadbent clearly showed the wisdom of the British Pharmacopœia. The B.P., as far as he remembered, required that cream of tartar should contain about 93 per cent. of acid tartrate of potassium. Those figures unmistakably proved that the Pharmacopœia had adopted a very fair standard, and had drawn a definite line between the chemistry of the matter on the one side and commerce on the other. They had there the public analyst of the district who not only treated pharmacists as they should be, but we are told that Mr. Allen allows a little more impurity than the British Pharmacopœia. That showed the wisdom of going even a little beyond the B.P. when tartrates are to be found containing that percentage only. [The reference is to Mr. Broadbent's calcium tartrate figures.] The observations made some years ago were upon a very different matter. He remembered Dr. Paul calling attention to the practice the people on the other side had of salting the casks of cream of tartar with sulphate of barium. At the time the matter created a sensation, and he believed that buyers had since kept a sharp look-out for barium salts.

Mr. FAIRLEY supported Mr. Broadbent's views. He also had examined some samples of cream of tartar, but had not in one case found barium.

Mr. CONROY had had for many years past a good deal of experience in the examination of cream of tartar, and he found the Pharmacopœia standard a very fair one. It was very rarely that he found tartrate of lime in excessive quantity, and never had he found a greater amount than 6 per cent. Years ago it was a very common thing to find barium; but the singular thing was that the barium was never more than 1 or 2 per cent., and he thought it was rather an accidental than a wilful adulteration. He might mention that at the present time there was a substance sold as cream of tartar which was not cream of tartar at all, but was an acid sulphate of potash with a certain percentage of starch added to it. This was chiefly used by bakers.

The PRESIDENT asked whether it was not sold as baking-powder.

Mr. CONROY: No; it is sold as cream of tartar.

Mr. CRIPPS said he had given a great deal of attention to the subject of late years. The test given by the Pharmacopœia was not one of direct saturation of the acid tartrate by alkali, for it included also the normal tartrate, if any were present, because the salt was ordered to be incinerated, and then to be treated with standard acid. In his experience cream of tartar was variable. He had examined considerably over 100 samples during the last three or four years, and had met with samples which contained as little as 80 per cent. of real bitartrate of potassium. He had also met with samples containing as much as 95 or 96 per cent. Very often a sample taken from the top of a cask showed a result 2 per cent. higher than was got from a sample taken when the whole contents of the cask had been mixed and ground. He thought cream of tartar varied very much; for instance, in the present year it had been better than it was some years ago. He believed it varied with the season a great deal. The Pharmacopœia standard, he thought, should be lowered to, say, 90 per cent., or even 89 per cent., of the real acid tartrate.

Dr. SYMES asked if Mr. Broadbent would tell the Conference whether he found sulphate of barium in the samples he had examined. It would be interesting, he thought, to know whether the discovery of the fact years ago had accounted for its absence now. It was never a very large percentage, and it was a well-known fact that in the upper portion of a cask no sulphate of barium could be found, while it was discovered at the bottom of the cask.

Mr. HODGKIN thought the different seasons had nothing to do with the amount of tartrate of lime which was in the samples. He did not see any reason why they should seek to decrease the standard of the Pharmacopœia. One of the objects of the Pharmaceutical Conference was to maintain uncompromisingly the principle of purity, and if they did what was suggested they were going directly against that

principle. He thought the time had come when they should seek to obtain a really pure article.

The PRESIDENT then asked Dr. Paul if he could give the percentage of sulphate of barium found when he examined the cream of tartar, as already mentioned. He believed it was very much more than 1 or 2 per cent.

Dr. PAUL said the quantity found amounted to a sensible adulteration of the article. It was first recognised by shaking the cask and the quantity of sulphate of baryta—for it was heavy spar that was used—fell to the bottom. There was no reasonable explanation to account for the presence of heavy spar as an accidental mixture with cream of tartar. (Laughter.) The powder was got from the bottom of the cask, which contained as much as one-third of sulphate of baryta.

Mr. KINNINMONT had also heard of the spurious substance sold as cream of tartar. A friend of his had a sample examined by a Glasgow analytical chemist, and they returned 4 per cent. of sulphate of barium. This percentage was so very small that he should think it would be hardly worth while adulterating to that extent, and the difficulty was to know whether the barium came in there as an express adulterant or whether it was accidental. The sample in question was French tartar from Bordeaux. Strangely enough 4 per cent. was the amount of the adulteration, and 4 per cent. was the difference in the price, so that it looked as if it had not been done accidentally.

Mr. WARD (Leeds) also thought it would be a mistake to recommend the pharmacopœial authorities to lower the purity of the article. His experience confirmed the opinion expressed by Mr. Hodgkin that there was no difficulty in obtaining pure cream of tartar that would answer to the pharmacopœial test if they were disposed to pay for it. Cream of tartar was one of those articles that were very much "cut," and there was a strong temptation to reduction in quality on account of this great desire to purchase, not the purest article, but at the lowest price. He thought the Pharmacopœia tests were sufficiently explicit for all purposes. It secured a commercially pure article without insisting upon that which would be very difficult to obtain unless it were specially prepared. It seemed to him that 92 per cent. of tartrate was not too much to demand from the manufacturer, and there was no difficulty in obtaining an article of that degree of purity. With regard to the presence of sulphate of barium, one might suppose it was possible for this to come from the treatment of the grape with certain earthy compounds which were frequently used to clarify wines, but this would not account for the presence of sulphate of barium in the cream of tartar, because the tartar had to be dissolved, so that sulphate of barium should not be present in the finished drug. He thought there was no doubt that the presence of the barium was a clear indication that it had been added intentionally for fraudulent purposes.

Mr. ABRAHAM asked whether they might take it that all the samples spoken of were free from adulteration; secondly, what degree of purity could be obtained, and what percentage of pure bitartrate of potassium could they obtain by simply filtering the solution while hot, thereby taking out the impurities. He thought that was a very simple means of purification, especially if an article could be obtained by that means containing 95 or 96 per cent.

Dr. STEVENSON MACADAM (Edinburgh) also spoke, but his remarks could not be heard at the reporters' desk.

DISTINGUISHED VISITORS.

At this stage the discussion was, at the suggestion of the President, suspended, as Sir F. Ahel, President of the British Association, and Professor T. E. Thorpe were to come into the meeting, and he proposed to get Mr. Hodgkin to read his paper, which was one likely to interest these distinguished visitors.

Sir F. Ahel and Professor Thorpe then came into the room, and were loudly cheered.

The PRESIDENT, in calling upon Mr. Hodgkin to read his paper on the "Constitution of Synthetic Remedies," said the subjects were interesting from various points of view.—the pharmaceutical, the medical and the chemical.

THE CONSTITUTION OF SYNTHETIC REMEDIES EXPLAINED
FROM A CHEMICAL POINT OF VIEW, SHOWING THEIR
RELATIONSHIP ONE TO ANOTHER.

By John Hodgkin, F.L.S., F.C.S., F.I.C.

At the outset the author called attention to the marvellous development of organic chemistry since Kekulé hit upon the benzene ring, and in this development therapeutics has shared, so that now we have a large number of synthetic bodies in medicine, the systematic nomenclature of which is most cumbersome and inconvenient for the use of medical men and others engaged in handling them. New or fancy names, expressing the object which is supposed to be obtained by their use, are therefore generally applied to these medicines, so that it often happens that we lose sight of the real relationship existing between bodies of analogous and allied constitutions, the connection being hidden under the fancy name, though easily recognised when examined from its chemical standpoint. It is this circumstance which induced the author to arrange such bodies under their proper chemical groups and subdivisions.

The synthetic remedies that we now employ may be divided into two great groups: those, such as chloroform, paraldehyde, sulphonal, &c., which belong to the series of methanes and aldehydes; and those, such as antifebrin, antipyrin, exalgin, beta-naphthol, thallin, &c., which belong to the aromatic series. As the former series contains compounds, such as chloroform, which occupy an earlier position in the history of synthetic remedies, the author dealt with this series first, which contains the anæsthetics and hypnotics, the aromatic series containing the antipyretics, antiseptics, &c.

Mr. Hodgkin proceeded to trace out on the blackboard the graphic formulæ of a selection of the substances named in the following list, which gives the single-line formulæ, and shows their constitution in the simplest way.

1. METHANES AND ALDEHYDES.

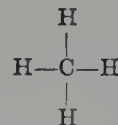
Marsh gas ...	CH ₄ .
Methyl chloride ...	CH ₃ Cl.
Methylene chloride...	CH ₂ Cl ₂ .
Chloroform ...	CHCl ₃ .
Tetrachloride of carbon...	CCl ₄ .
Ethyl chloride ...	CH ₃ (CH ₂)Cl.
Ethylidene chloride...	CH ₂ (CHCl ₂).
Methylal ...	CH ₂ (CH ₂ O) ₂ .
Methyl alcohol ...	CH ₃ (OH).
Amylene hydrate ...	C(CH ₃) ₂ (C ₂ H ₅)(OH).
Sulphonal ...	C(CH ₃) ₂ (SO ₂ C ₂ H ₅) ₂ .
Reversed sulphonal...	C(C ₂ H ₅) ₂ (SO ₂ CH ₃) ₂ .
Trional ...	C(CH ₃)(C ₂ H ₅)(SO ₂ C ₂ H ₅) ₂ .
Tetronal ...	C(C ₂ H ₅) ₂ (SO ₂ C ₂ H ₅) ₂ .
Formic aldehyde ...	CO(H).
Hypnone ...	CO(CH ₃)(C ₂ H ₅).
Urethane ...	CO(NH ₂)(O.C ₂ H ₅).
Aldehyde ...	CO(CH ₃)H.
Chloral anhydride ...	CO(CCl ₃)H.
Chloral hydrate ...	C(OH)(CCl ₃)H.
Ural ...	C(OH)[CO(NH)(O.C ₂ H ₅)](CCl ₃)H.
Somnal ...	C(O.C ₂ H ₅)[CO(NH)(O.C ₂ H ₅)](CCl ₃)H.
Chloralamide ...	C(OH)[CO(NH)H](CCl ₃)H.
Butyl chloral hydrate	C(OH)(CH ₂) ₃ (CCl ₃)H.

2. AROMATIC SERIES.

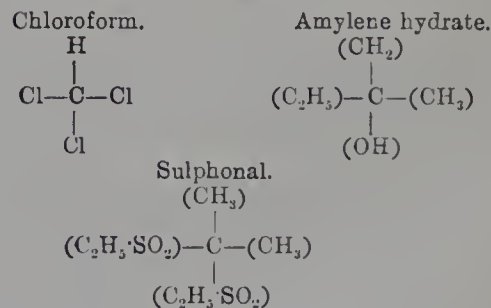
Benzol ...	C ₆ H ₆ .
Aniline ...	C ₆ H ₅ NH ₂ .
Acetanilide ...	C ₆ H ₅ NHCH ₃ CO.
Benzanilide ...	C ₆ H ₅ NH.C ₆ H ₅ CO.
Exalgin ...	C ₆ H ₅ N(CH ₃)CH ₃ CO.
Phenyl-hydrazine ...	C ₆ H ₅ NH.NH ₂ .
Pyrocin ...	C ₆ H ₅ NH.NHCH ₃ CO.
Antithermin ...	C ₆ H ₅ NH.NH.C ₂ H ₅ O ₂ .
Antipyrin ...	C ₆ H ₅ (C ₂ H ₅ N ₂ O).
Antiseptin ...	C ₆ H ₅ Br.NHCH ₃ CO.
Phenacetin ...	C ₆ H ₅ (O.C ₂ H ₅).NHCH ₃ CO.
Methacetin ...	C ₆ H ₅ (O.C ₂ H ₅).NHCH ₃ CO.
Methyl-phenacetin ...	C ₆ H ₅ (O.C ₂ H ₅).N(CH ₃)CH ₃ CO.
Benzoic acid...	C ₆ H ₅ COOH.
Salicylic acid ...	C ₆ H ₄ (OH)COOH.

Salol ...	C ₆ H ₄ (OH).COO(C ₂ H ₅).
Dithiosalicylic acid...	(C ₆ H ₄ OH.COOH.S) ₂ .
Phenol ...	C ₆ H ₅ .OH.
Trichlorophenol ...	C ₆ H ₂ Cl ₃ .OH.
Aseptol ...	C ₆ H ₄ OH.SO ₂ OH.
Sozoiodol ...	C ₆ H ₄ I ₂ OH.SO ₂ OH.
Toluol ...	C ₆ H ₅ .CH ₃ .
Alpha-toluic acid ...	C ₆ H ₄ .CH ₃ (COOH).
Homo-toluic acid ...	C ₆ H ₃ .CH ₃ .CH ₂ (COOH).
Cresol ...	C ₆ H ₄ .CH ₃ .OH.
Cresalol ...	(C ₆ H ₄ .CH ₃)OOC.C ₆ H ₄ .OH.
Thymol ...	C ₆ H ₃ .CH ₃ .C ₂ H ₅ .OH.
Aristol ...	(iodine derivative of thymol)
Naphthalene...	C ₁₀ H ₈ .
Naphthylamine ...	C ₁₀ H ₇ NH ₂ .
Thermin ...	C ₁₀ H ₇ .H.NH ₂ .
a-Naphthoic acid ...	C ₁₀ H ₇ COOH.
a-Oxynaphthoic acid	C ₁₀ H ₆ (OH).COOH.
a-Naphthol ...	C ₁₀ H ₇ .OH.
β-Naphthol ...	C ₁₀ H ₇ .OH.
Betol ...	C ₁₀ H ₇ .OOC.C ₆ H ₄ OH.
Quinoline ...	C ₉ H ₇ N.
M. Kairolin ...	C ₉ H ₇ (H ₃ .CH ₃).N.H ₂ .SO ₂ .
A. Kairolin ...	C ₉ H ₇ (H ₃ .C ₂ H ₅).N.H ₂ .SO ₂ .
M. Kairin ...	C ₉ H ₆ (OH)(H ₃ .CH ₃).N.HCl.
A. Kairin ...	C ₉ H ₆ (OH)(H ₃ .C ₂ H ₅).N.HCl.
Thallin ...	C ₉ H ₆ (O.C ₂ H ₅)(H ₃).N.
Ethyl-thallin ...	C ₉ H ₆ (O.C ₂ H ₅)(H ₃ .C ₂ H ₅).N.
Chinazoline ...	C ₈ H ₆ N ₂ .
Orexine ...	C ₈ H ₆ (HC ₂ H ₅)N ₂ .
Pyrrol ...	C ₄ H ₅ NH ₂ .
Iodol ...	C ₄ I.NH.

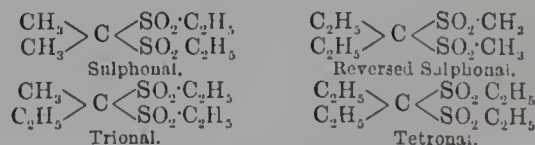
The list above gives to those who are versed in constitutional formulæ a clear idea of the different compounds mentioned; but the addition of graphic formulæ further elucidates the constitutional characteristics. Thus marsh gas, or methane, may be put down as



each hydrogen atom being replaceable by certain other elements, such as chlorine; or compound radicles, such as methyl, ethyl, &c. Thus we have:—

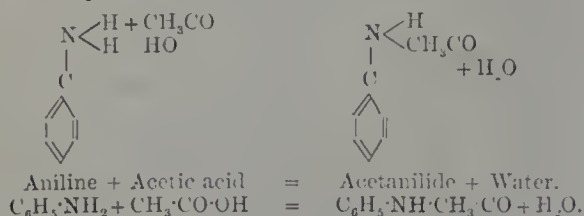


The formula for sulphonal is here placed in this shape so as to show how it differs from amylene hydrate; but it is generally put in another fashion, which, as Mr. Hodgkin explained, shows the intimate relation between the allied bodies figured below:—



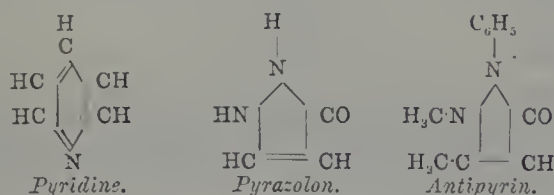
Some formulæ are necessarily very complicated to look at, as, for instance, those of the formic aldehyde derivatives; but the intricacy becomes more marked when we come to the aromatic series, which, as explained, are benzene or naphthalene derivatives. We shall not attempt to give here the graphic formulæ of the primary compounds, and suggest reference to such works as Hjeld's "Organic Chemistry," or the preface to the new edition of Watts's "Dictionary," wherein the theories upon which these "rings" are based are

fully explained, and many examples of general interest are given. It will suffice to place here a few of the more important of the formulæ. Thus the following shows how, by the replacement of one hydrogen by the acetyl group CH_3CO , *Acetanilide*, or *Antifebrin*, is obtained from aniline:—



It will be seen on reference to the list that exalgine and antithermin are very closely allied to antifebrin. Passing down the list to antipyrin, we reach a new type. This is made by acting upon phenylhydrazin with aceto-acetic ether, whereby condensation takes place, with elimination of water and alcohol, and a new body, originally called methyl-oxychinizin, but now called phenylmonomethyl pyrazolon, is produced.

By heating this body with methyl-iodide and methyl-alcohol to 100°C . a fresh methyl group is introduced, and we get phenyl-dimethyl-pyrazolon, or antipyrin. Mr. Hodgkin illustrated the stages in this transformation from pyridine to antipyrin, and part of this we may represent thus:—



These examples will suffice to show that graphic formulæ really help us to understand these new bodies and to perceive the relationship that exists between bodies of an allied constitution, but it must not be assumed that the replacements of, say, a CH_3 group, a C_6H_5 , or anything else, are always those which actually occur in making fresh bodies: they simply show the differences from a structural point of view that exist between the type and the derivative.

DISCUSSION.

The PRESIDENT said the paper had arrived most opportunely, for pharmacists had been walking as in a maze during the last few years. These preparations had come up thick on all sides. He asked Sir F. Abel to favour them with a few remarks.

Sir F. ABEL said it afforded him very great pleasure to pay a visit to the Pharmaceutical Conference. He saw amongst those before him many gentlemen whom he had met on former occasions, and whom he was proud to consider his colleagues in chemical science. He was especially proud to be present when he observed pharmaceutical chemists following with such interest what appeared to be the intricacies of graphic formulæ, which, after all, afforded some of the greatest means in grappling with the ever-increasing knowledge with regard to the organic branch of chemical science that they possessed. There was no doubt that in the hands of the scientific chemist graphic formulæ had been of the greatest assistance in explaining the result of his research to those able to follow it. He was sure that the study of graphic formulæ of those bodies could not but assist largely to the knowledge of their constitution, and a knowledge, which was daily increasing, of their uses and applications. He could not venture to discuss Mr. Hodgkin's interesting paper. He thought Mr. Hodgkin had put the whole subject very clearly and concisely in his abstract of the paper, and he was sure this paper *in extenso* would be well worth study, not merely by the pharmaceutical chemist, but by those who desired to see the connective history of that most interesting class of remedies. (Hear, hear.) He thanked them for allowing him to say a few words, and said it had afforded him the greatest pleasure to have had the opportunity of

attending, although for so short a time, that Conference. (Cheers, during which Sir F. Abel and Professor Thorpe retired.)

The PRESIDENT said he felt they could not have had a more fitting subject to discuss in the presence of distinguished chemists than the paper Mr. Hodgkin had put before them. He called upon Mr. Allen, of Sheffield, to speak.

Mr. ALLEN congratulated the author of the paper on the very full manner in which he had covered the subject. Of course he was handicapped in having to say a great deal in a short time, but he was struck with the completeness with which he seemed to discuss the whole of the new remedies, and each one at least received mention in the paper. He hoped when they saw it in print that there would be some reference made to the effect of isomerism on the physiological action of those bodies. He was not aware of any researches having been published as to the physiological effect of some of the bodies, such as phenyl-dimethyl-pyrazolon, the scientific name of antipyrin. They had three isomers in the aromatic series, one of them salicylic acid, and other two, one of which was said to be very deficient in antiseptic properties. It was exceedingly important that they should master the constitution of these bodies. It was only by attending to the minute differences that they got the explanation of the numerous effects of the substances. Sometimes a new body, when prepared, gave results which were not satisfactory, and it turned out afterwards that that was due to the presence of some impurity. That had been the case with salicylic acid. Two homologue acids had been found in salicylic acid. They formerly found the homologues in salicylic acid far more frequently than at present, just as the acid used to contain cresotic acid more frequently than now. They should rather encourage the use of descriptive names for complex synthetic bodies. It was true that sometimes they were very long and unwieldy, but, at the same time, if, instead of calling a man John Smith—which gave very little idea of his character—they could find a name which would describe him as a tall, light-haired man, blind in the right eye, having the power of limping with the left leg, and of a peculiarly irascible temperament, it would be like the name they gave to their chemical substances. (Great laughter.) If they were to adopt trivial names, he would rather have those that suggested the characteristics of the body than its method of preparation. For instance, the constitution originally attributed to antipyrin by its discoverer was that of methyl-oxychinizin, which he changed afterwards to phenyl-dimethyl-pyrazolon. If it was described in the Pharmacopœia, as had been suggested, as a derivative of quinoline, that would be a great mistake. It was not made from quinoline, nor did they regard it as a derivative. On the other hand, he could not say that the name phenylon, suggested by the Pharmacopœia authorities, appealed to him much; he would rather call it antipyrin, as the Germans did. If it was a trivial name, it described its leading property. He would far rather stick to that name than adopt such a name as phenylon.

Dr. THRESH said that the President yesterday referred to the subject of fashion in medicine, and they must remember that this change in fashion was only to be deprecated when it was carried to excess, and it was admitted on all hands that the present change was in the right direction. Chemists were engaged in the formation of multitudes of new bodies, such as Mr. Hodgkin had described, whilst physiologists and therapists were engaged in investigating the action of some of them. Unfortunately for the public, the number of new bodies named was legion, whereas the number of bodies whose physiological action had been ascertained could be counted on one's finger-ends. At the same time they were beginning to discover that there was a relationship between chemical structure and physiological action, and it was in this direction they must look for some of the most important discoveries in the future. The author of the paper had been, in his opinion, a little too dogmatic. A great number of these bodies, which were believed from the statement of the discoverers to be of a particular nature, would be regarded from another point of view in a year or two. Students who read the paper should bear that in mind. At the present time students were obliged to assimilate, or attempt to assimilate, so much in a short time that they were unable to distinguish between what was fact and

what was theory. With these words of warning he should like to add that the paper was likely to be of lasting interest to pharmacists, and also to medical students. The arrangement of a series showing the relationship of one body to another was excellent, and would enable such pharmacists as wished to keep themselves abreast of the time with comparative ease. (Cheers.)

Mr. FAIRLEY said the paper was calculated to draw attention to the relation between chemical composition and physiological action of the bodies, a subject which many years ago was embarked on by Professor Crum Brown; and if it were followed up he had no doubt it would lead to pharmacists being enabled to get drugs such as they required for special purposes. They would be able to obtain drugs which would act in a particular way by the method of their preparation.

Mr. SCHACHT said he had more than once asked a question which occurred to him without getting a reply; was it supposed that the physiological action resulted from the operation of the chemical as a whole, or was it modified by the particular conditions which from time to time were supposed to occur? In a mercuric body certain elements seemed to be less closely attached to the whole than some others, consequently the physiological action might depend upon the operation of the mercury as a whole, or upon the portion which was capable of easy separation from the remainder by the internal organism.

The PRESIDENT said it was quite clear that chemists, like doctors, differed. The whole of this subject might be changed, as Dr. Thresh had pointed out, in the next few years, but he was sure it would be of the greatest benefit to pharmacists to know where they were, and the paper of Mr. Hodgkin was calculated to show that.

Mr. HODGKIN, in replying, said he had carefully avoided all reference to physiological and pharmaceutical matters in his paper. What he had attempted to do was to take the best-recognised formulæ for those bodies, and show them the changes that might be supposed to have taken place in these bodies, and the difference between one body and another. With regard to Dr. Thresh's remarks about his being too dogmatic, he called attention to some remarks at the end of his paper, in which he pointed out what Dr. Thresh had suggested. He simply dealt with the matter from a structural point of view. With regard to Mr. Schacht's question, the physiological action had been fully explained some time ago by Dr. Lauder Brunton in his Croonian lectures, the study of which he recommended.

The following paper was then read by the author:—

ON THE ESTIMATION OF MINERAL OIL, OR UNSAPONIFIABLE MATTER.

By T. Fairley.

In this district large quantities of oil and grease are used in various manufacturing operations, and chiefly in the woollen and leather manufactures. Much of this oil is recovered and used again for the same or other operations. It is frequently found that these recovered oils and greases contain large proportions of mineral oil or unsaponifiable or resinous matter, which, however, are not always readily estimated by the ordinary processes given in text-books. The following process worked out in my laboratory has been found to succeed in these cases:—

Five grammes, equivalent to nearly 80 grains, of the oil are weighed out, saponified with alcoholic potash (about 80 grammes KHO in 1,000 c.c.), evaporated in a basin on a water-bath to pastiness, then dissolved in from 45 to 50 c.c. warm water, placed in a separating funnel, and treated with an equal volume of ether, to which 2 to 3 c.c. of alcohol have been added, shaken 3 to 4 minutes, and allowed to stand, to let the ethereal solution come to the surface, which is decanted and evaporated.

A second treatment with ether is unnecessary, because, as a rule, the results with a single extraction are correct within 0.1 and 0.2 per cent.

The points in this process are:—

1. Keeping the aqueous solution of the soap obtained within a volume not exceeding (for 5 grammes of oil) 50 c.c.

2. Treating with an equal volume of ether in one operation at a temperature of near 90° Fahr. Then, on standing (and cooling by cold water if necessary), the ethereal solution of the mineral oil separates, and in all successful

experiments is very nearly equal to the volume of ether employed.

3. Washing this ethereal solution by water introduced into the separating funnel which can be done very quickly and effectively.

4. When the residue left after evaporation of the ether and drying, has been weighed, it should always be distilled in a small tube retort. If it distils unchanged without blackening or formation of acrolein it is free from soap or ordinary fats.

The peculiar bitter after-taste and fluorescence of oils containing mineral oil are also points of importance. The results obtained by the process by two workers were shown to be concordant.

Following this, Mr. Fairley read another paper,

ON THE ESTIMATION OF COTTON-SEED OIL IN LARD.

By Messrs. Fairley and Cooke.

For this purpose Bechi's test, when carefully worked, gives useful results, which can be confirmed by the observation of the heat given out in mixing the sample with a definite proportion of sulphuric acid.

Attempts have been made to apply the specific-gravity test; and Bockairy, in a recent number of the *Bulletin de la Société Chimique*, 3rd Series, ii., 310, takes the density of the lard at 50° C. = 122° F. He finds that the unadulterated lards vary little in density as taken at this temperature, and that there is a sufficient difference between the density of lard and cotton-seed oil to give a means of approximate quantitative estimation.

Bockairy gives the following numbers indicating density at 50° C.:—Lard, highest, .8915; lard, lowest, .889; lard, mean, .890; very rancid lard, .8895; oleo-stearine, .8885; renal fat of the ox, .8895; new cotton-seed oil, .897; and old cotton-seed oil, .896.

New Cotton-seed Oil and Lard.

Cotton-seed Oil.	Lard.
0	100
10	90
20	80
30	70
50	50
75	25
100	0
	.. .. .890
	.. .. .8915
	.. .. .892
	.. .. .8925
	.. .. .894
	.. .. .8953
	.. .. .897

Careful experiments made in my laboratory by my assistant, Mr. A. W. Cooke, fully confirm the utility of the method, and prove that it may give a most valuable confirmatory test. The following are a few results:—

Sp. gr. of mixtures at 50° C. (water at 50° C. = 1,000).	Sp. gr. of mixtures at 50° C. (water at 15.5° C. = 1,000)
Lard.	Lard.
900.42 } Mean = 900.30.	891.63 } Mean = 891.59.
900.35 } Lard + 10 per cent. cotton-seed oil.	891.56 } Lard + 10 per cent. cotton-seed oil.
931.19 } Mean = 901.16.	892.39 } Mean = 892.46.
901.13 } Lard + 20 per cent. cotton-seed oil.	892.53 } Lard + 20 per cent. cotton-seed oil.
902.15 } Mean = 902.09.	893.34 } Mean = 893.28.
902.03 } Lard + 75 per cent. cotton-seed oil.	893.22 } Lard + 75 per cent. cotton-seed oil.
907.33 } Mean = 907.36.	893.48 } Mean = 893.50.
907.39 } Cotton-seed oil.	893.53 } Cotton-seed oil.
908.72 } Mean = 908.79.	899.87 } Mean = 899.92.
908.86 }	899.93 }

DISCUSSION.

Mr. ALLEN said he had listened to the paper on analysis of oils with very great pleasure. As a matter of fact, it really got over a very great difficulty. By keeping down the volume of the watery solution they could effect a separation, and only those who had had experience of the separation of ether from the soap solution could fully appreciate the value of Mr. Fairley's observations. In the matter of the lard, the question of the specific gravity of melted lard and cotton-seed oil was well known, and all chemists now saw the importance of specific gravity as a means of estimating the extent of adulteration. The point which Mr. Fairley had brought forward was the use of a temperature of 50° C. instead of the ordinary 100° F., or 100° C. The practical advantage of always using 100° C. was that one could always get it,

and they could readily understand that using a specific-gravity bottle at such an awkward temperature as 50 C., and keeping it at that temperature, was difficult. With respect to other tests, he had used, ever since its publication, Mr. Conroy's process for detecting cotton-seed oil with very great success.

Mr. CONROY, referring to the second paper, said perhaps Mr. Fairley had good grounds for considering the specific gravity of lard to be .889; but he thought, in the first place, it would only be fair if the author of the paper would tell them what he considered lard to be. (Laughter.) Was it the British Pharmacopœia article, or the ordinary lard sold, which was made from the backs of bacon and things of that kind containing the oil, or was it American pressed lard? They could not expect the specific gravity of those lards to be identical. Cotton-seed oil was not the only thing added to lard by adulterators; they always added mutton suet or some other solid fat with it. The presence of this matter would entirely upset that test. Perhaps Mr. Fairley could throw a little more light upon that, otherwise they had a test of very little value.

Mr. CRIPPS expressed the same views as Mr. Conroy, and asked Mr. Fairley if he had tried lime absorption as a means of estimation.

Mr. HASSLEBY said there was one point with regard to the admixture of cotton-seed oils with mineral oils which he would like to mention. The mixture of mineral oils with it was a great benefit. The curse was that they got blown rape and blown cotton-seed oils mixed with it. If gentlemen would give them a test for that, it would be of very great value indeed to chemists throughout the country.

Mr. NAYLOR asked if the author had had any experience in the use of auric chloride in testing for cotton-seed oil.

Mr. FAIRLEY, replying to Mr. Allen's remarks about the temperature at which the specific gravity was taken, said that 50° C. was a little higher than 100 F.; but Bockairy adopted that temperature so as to secure greater fluidity, in case some of the fatty substances present might not be perfectly fluid at a lower temperature. The samples of lard shown were made in the town, and were not American lard. He had not made experiments to test the influence of heat on beef suet, &c., but he had no doubt that that would certainly modify the results. He had tried iodine absorption of oils, and had no doubt it would be useful. He had not used auric chloride.

Previous to this discussion Mr. Fairley read another paper

ON THE CHEMISTRY OF BILE,

which we have purposely reserved for this position. He explained that a local physician had found it necessary to make a fistula into the liver of a lady patient, consequently there was a daily discharge of 30 oz. of bile from the liver, and he had had an opportunity of making an analysis of it. He found an entire absence of sulphates, but sulphur was present in some form, which he conjectured to be taurocholic acid. The gall-bladder fluid was mixed with the bile, and an analysis of it showed the presence of copper. This was a remarkable fact, but Mr. Fairley was emphatic as to the correctness of his observation, and conjectures that it is always present. The fluid was found to be powerfully antiseptic.

There was no discussion on this note, luncheon again proving an overwhelming attraction. After the members returned they had the last about

CREAM OF TARTAR,

Mr. Broadbent's reply having been overlooked. That gentleman now said that Mr. Abraham wanted to know whether the samples that he gave the analyses of were free from adulteration. That depended on how they read the Pharmacopœia. He should say they were. With regard to the degree of purity that could be obtained, he had this week found a sample that was warranted to contain 100 per cent. of bitartrate, and he found it contained 99.6; but the price was just half as much again as the ordinary.

The PRESIDENT asked if the cream of tartar was natural.

Mr. BROADBENT said it was submitted to them as cream of tartar guaranteed 100 per cent.

The PRESIDENT: And your opinion, I gather, was that it was chemically produced?

Mr. BROADBENT: Yes.

Then followed a

NOTE ON A SAMPLE OF ADULTERATED SAFFRON.

By William Kirkby, F.L.S., Pharmaceutical Chemist.

After commenting on the frequency of saffron adulteration the writer mentioned the vegetable substances used for the purpose during recent years. The object of the paper was to give a description of a sophistication observed during the present year.

This particular sample was different in colour from the genuine article, the difference being due to the presence of a large number of narrow, flattened fibres having a Turkey-red colour. These varied in length from about $\frac{1}{2}$ inch to $1\frac{1}{2}$ inch. The amount of adulterant was estimated at 41 per cent.

With the purpose of ascertaining its source it was examined with the microscope. The anatomical peculiarities were then described, the principal features being a central vascular bundle of the centric type, four cortical vascular bundles situated just within the epidermis, and four large air-canals, alternating with the vascular bundles in the thick cortex. From this examination it was concluded that the fibres were furnished by a plant of the Cyperaceæ—possibly a species of *Carex*. This appears to be confirmed by the finding in the sample of two fragments bearing leaves. The paper was concluded by the writer pointing out that this particular sophistication may be detected by the fibres having a Turkey-red colour, by being nearly uniform in thickness, and by their rigid appearance. It may be identified by means of the anatomical characteristics of the fibres.

A chalk diagram on the blackboard served to show the appearance of a transverse section of the adulterant. Commenting upon the paper, the President said that it was very important that merchants and pharmacists should be kept well posted regarding such matters as this, for adulteration of saffron had been long practised, and they ought to ensure that what they were buying for saffron was not something else. Mr. H. Long wanted to know what use saffron was in medicine; but he only got a laugh for a reply, as the members by this time were ready for the monumental papers of the meeting. First there was one on—

THE SOLVENT ACTION OF ALCOHOL OF DIFFERENT DEGREES OF STRENGTH ON SOME OF THE DRUGS USED IN MAKING PHARMACOPŒIAL TINCTURES.

By R. Wright, Pharmaceutical Chemist, Buxton.

Considering the importance of the tinctures as a class of therapeutic remedies, it is rather remarkable they have not occupied a more prominent position in the experimental work done by practical pharmacists. It is true that an occasional paper on the subject has been read at meetings similar to this—notably by Mr. W. D. Savage, the late Mr. Stoddart, and others—but, so far as I am aware, no attempt has hitherto been made to ascertain the comparative value of alcoholic menstrua of different degrees of strength, for the extraction of the more important drugs in the materia medica. It was in the hope that such an investigation would tend to throw a little light upon the subject that about three years ago a series of experiments was set on foot, the results of which are embodied in the present paper. The original idea was to prepare those of the B.P. tinctures as lend themselves most readily to such a form of treatment with alcohol of three or four different degrees of strength by the same process, and then to estimate the quantity of solids taken up by each, by ascertaining the amount of extract left when a given volume was evaporated, and the residue heated until it ceased to lose weight. In the case of the tinctures representing drugs the medicinal activity of which was supposed to be due to the presence of one or more alkaloids, it was further proposed to attempt the comparative estimation of the quantity of alkaloids in each; and this was done by processes described later on in the paper.

The standard tinctures were prepared in the following manner:—The B.P. quantity of the drug ordered for half a pint of tincture was taken, and, where necessary, reduced to powder of the requisite degree of fineness. It was then placed in a well-corked wide-mouthed bottle, into which

the spirit had been previously measured, and allowed to macerate for ten days, the bottle being shaken daily. At the end of that time, the clear tincture was poured away; the residual marc strained and pressed, the expressed tincture being added to that which had been poured off, and the whole filtered.

In the preparation of menstrua it was thought best, for the sake of convenience, to use the rectified spirit of the British Pharmacopoeia, s.g. 838, and containing 84 per cent. absolute alcohol as the basis.

The rule followed in the selection of menstrua was to prepare each rectified-spirit tincture with alcohol of the following degrees of strength:—No. 1 with rectified spirit; No. 2 with 4 vols. s.v. rect. + 1 vol. water; No. 3 with 3 vols. s.v. rect. + 1 vol. water; and No. 4 with proof spirit.

In the case of the proof-spirit tinctures the rule was to make each tincture with alcohol of the following degrees of strength:—No. 1 with rectified spirit; No. 2 with 3 vols. s.v. rect. + 1 vol. water; No. 3 with proof spirit; and No. 4 with s.v. rect. and water, of each equal volumes.

Of the seventy-two tinctures contained in the B.P., forty-eight were thus prepared, the following twenty-four being eliminated:—

Aurantii recentis, *benzoini composita*, *camphoræ composita*, *cannabis indicæ*, *cardamomi composita*, *chloroformi composita*, *chloroformi et morphinæ*, *cinchonæ composita*, *ergotæ*, *ferri acetatis*, *ferri perchloridi*, *iodi*, *kino*, *lavandulæ composita*, *limonis*, *lobeliæ æthereæ*, *nucis vomicæ*, *opii ammoniata*, *podophylli*, *quininæ*, *quininæ ammoniata*, *tolutana*, *valerianæ ammoniata*, and *zingiberis fortior*.

Tinctura guaiaci ammoniata was subjected to special treatment. It is a well-known fact that the B.P. menstruum—viz., aromatic spirit of ammonia—is not well adapted for extracting all the active principles of the resin, on account of the quantity of water which it contains. Two samples of tincture were prepared—one according to the B.P. formula, the other with an ammoniated menstruum, made by mixing 18 fluid ounces of rectified spirit with 2 fluid ounces of strong solution of ammonia.

Of the tinctures thus prepared, a fluid ounce of the first yielded on evaporation 62 grains dry extract, whilst the same quantity of the second gave 82 grains. With regard to *tinctura cocci* and *tinctura croci*, which are almost exclusively employed as colouring agents, it was thought desirable to ascertain the colouring power of each of the tinctures. It was found that cochineal yielded its colouring principle almost equally well to proof spirit, or to a rather stronger or slightly weaker spirit. Saffron, on the contrary, only yields its most powerful colouring principle to a strong alcoholic menstruum. A mixture of three volumes rectified spirit with one volume of water yielded a tincture having forty or fifty times the colouring power of the B.P. proof-spirit tincture.

In the case of compound tinctures—*eg*, catechu, aloes, gentian, rhubarb, and senna—the B.P. quantity of the principal drug only was taken.

The tinctures which are supposed to owe their medicinal properties to the presence of one or more alkaloids are those of aconite, belladonna, cinchona, conium, colchicum, hyoscyamus, opium, stramonium, and veratrum viride. The general process adopted for the estimation of the alkaloids was as follows:—

A fluid ounce of the tincture was run into a porcelain dish, 20 drops of dilute sulphuric acid added, and the spirit driven off by heating over a water-bath. The residual liquid was allowed to cool, and then filtered through a plug of cotton wool, placed in the neck of a small funnel, into a separating funnel, the dish and funnel being rinsed with a little distilled water. The liquid in the separating funnel was then shaken up with two successive 10 c.c. chloroform to remove colouring-matter. It was then rendered alkaline by adding ammonia in slight excess, and the alkaloids removed by shaking first with 20 c.c. and then with 10 c.c. chloroform. The chloroformic solutions were drawn off into a tared platinum dish, and evaporated to dryness over a water-bath, the alkaloidal residue being re-heated until the weight was constant.

The above process was applied to all the alkaloidal tinctures except three—viz., cinchona, conium, and opium. For conium a modification of the above was employed, the alkaloids being shaken out with chloroform, and the chloro-

formic solutions run into a platinum dish containing 20 c.c. of a saturated solution of hydrochloric-acid gas in chloroform. Care must be taken that the end of the funnel-tube passes beneath the surface of the acid chloroform, or loss of alkaloid by volatilisation takes place. The chloroformic solution was then allowed to evaporate in a current of air, and the residue heated at a temperature not exceeding 70° or 80° C. until it ceased to lose weight, the alkaloids being weighed and estimated as hydrochlorates.

The alkaloids in the cinchona tinctures were estimated as follows:—

A fluid ounce of the tincture was introduced into a porcelain dish; 20 grains of recently-slaked lime was added; the whole well mixed and evaporated to dryness. The dry residue was powdered, mixed with a little fine-washed sand, and the powder placed in an extraction apparatus and exhausted with boiling chloroform, 40 c.c. of the latter being employed for that purpose.

When the process was complete the chloroformic solution was filtered from the particles of lime which had washed through, the filter rinsed with a little more chloroform, and the chloroform driven off by evaporation, and the residue weighed.

TABLE I.

Showing amount of extract (in grains) yielded by 1 fluid ounce of each sample.

Tincture	Strength of Menstruum used			Proof Spirit
	S. V. Rect.	S. V. R. 4 vols. Water 1 vol.	S. V. R. 3 vols. Water 1 vol.	
Aconiti	4.5	8.0	10.0	10.0
Arnica	2.5	4.0	4.0	4.0
Asafoetida	31.0	32.0	29.0	14.5
Capsici	2.5	3.5	3.5	3.0
Cinchona	19.0	22.0	22.0	23.0
Cinnamomi	7.0	9.0	9.0	6.0
Cubebe	8.0	8.5	8.5	8.5
Larici	7.5	7.5	8.0	7.5
Myrrha	19.0	14.5	9.5	NH
Pyrethri	7.0	10.5	10.5	12.0
Sumbul	13.0	15.0	15.0	15.0
Veratri viridis	5.0	6.5	7.0	7.0
Zingiberis	2.0	3.5	3.5	3.5

Tincture	S. V. Rect.	S. V. R. 3 vols. Water 1 vol.	Proof Spirit	S. V. R. Water = volumes
Aloes	10.5	11.5	12.0	12.0
Aurantii	9.0	14.0	14.0	15.0
Belladonna	3.0	5.0	6.0	6.0
Buchu	6.0	11.5	12.5	12.5
Calumbæ	3.0	7.0	8.0	8.0
Cantharidis .. ..	.5	.5	.75	1.0
Cascarilla	6.5	8.0	8.0	8.0
Catechu	45.0	49.0	50.0	50.0
Chirata	6.0	8.0	8.0	8.0
Cimicifugæ	8.0	12.0	15.0	13.0
Cocci	7.5	15.0	15.0	15.0
Colchici	9.0	11.0	12.0	16.0
Conii	6.0	6.0	6.5	8.0
Croci	7.0	11.0	11.5	10.5
Digitalis	11.0	17.0	22.0	22.0
Gallæ	44.0	44.0	4.0	40.0
Gelsemii	4.5	7.0	7.0	7.0
Gentianæ	10.5	16.5	17.0	17.0
Hyoscyami	13.0	16.0	20.0	19.0
Jaborandi	12.0	16.0	18.0	20.0
Jalapæ	9.0	14.5	16.0	16.5
Krameria	21.0	20.0	20.5	19.5
Lobelia	7.0	10.5	11.5	14.5
Lupuli	7.0	8.5	9.5	10.0
Opii	16.0	18.0	13.0	18.0
Quassia	?	.5	.5	.5
Rhei	14.5	17.5	18.0	18.5
Sabina	14.0	15.0	14.0	14.0
Scilla	5.5	38.0	42.0	42.0
Senega	16.0	18.0	18.5	18.0
Senna	7.5	12.5	14.0	15.0
Serpentaria	3.5	4.5	4.5	4.0
Stramonii	2.5	2.5	3.0	3.0
Valeriana	5.0	9.0	9.0	10.0

For the estimation of the opium alkaloids the following process was followed:—

A fluid ounce of the sample was evaporated to low bulk

over a water-bath, the residual liquid allowed to cool, and then filtered through a plug of cotton-wool, placed in the neck of a small funnel, into a separating funnel, the dish and funnel rinsed with a little distilled water, and the rinsings run into the separating funnel. Ten drops of B.P. liquor ammoniac was then added, and the separated alkaloids shaken out with two successive 40 c.c. of a mixture of equal volumes of chloroform and acetic ether. The alkaloidal solutions were then evaporated to dryness, and the residue heated over a water-bath until it ceased to lose weight.

The general results obtained from these experiments, as shown upon the tables, go to prove that some at least of the menstrua for B.P. tinctures might be modified with advantage.

It is quite true that, as a rule, tinctures made with a strong spirit keep better, and are less prone to deposit than those made with a weaker one. In order to test the effect of keeping upon the stability of the tinctures made during the course of these experiments, a sample of each was kept for a period of from two to three years.

TABLE II.

Showing amount of alkaloid (in grammes) yielded by 1 fluid ounce of each of the alkaloidal tinctures.

Tincture	S. V. Rect.	Strength of Menstruum used		Proof Spirit	S. V. R. Water = volumes
		S. V. R. 4 vols. Water 1 vol.	S. V. R. 3 vols. Water 1 vol.		
Aconiti ..	0185	0246	0246	0244	—
Belladonna ..	0082	—	0079	0068	0069
Cinchona ..	1560	1593	1588	1590	—
Colchici ..	0036	—	0030	0032	0034
Conii ..	0375	—	0477	0465	0471
Hyoscyami ..	0059	—	0053	0060	0062
Jaborandi ..	0198	—	0360	0454	0516
Opil ..	3374	—	3824	4068	4252
Stramonii ..	0077	—	0104	0091	0052
Veratri viride ..	0229	0294	0311	0360	—

Of these only three tinctures made with rectified spirit show any deposit—viz., cinchona, cocci, and aloes. On the other hand, tincture of conium and tincture of galls made with proof-spirit have thrown down a considerable amount of deposit. The former should, undoubtedly, be prepared with a stronger spirit; a tincture made with a menstruum composed of 3 vols. s.v. rect. and 1 vol. water remains clear and free from turbidity for an indefinite period. As for tincture of galls, the three samples of lowest alcoholic strength have all deposited considerably, the rectified-spirit tincture alone remaining clear. As rectified spirit exhausts the drug more perfectly than a weaker spirit, it would, apparently, be advisable to make the tincture with a stronger alcoholic menstruum than the proof spirit at present official.

Of tinctures made with rectified spirit, which are equally well prepared with a slightly weaker menstruum, are pyrethrum, cinnamon, asafoetida, and snmbnl.

Of tinctures now directed to be made with proof spirit, which yield an equally good or better product when prepared with a menstruum consisting of equal volumes of rectified spirit and water, are quassia, krameria, scenna, catechu, digitalis, jaborandi, opium, aloes, cascarilla, and senega.

Mr. Naylor then gave the gist of the following

NOTES ON SOME ALKALOIDAL TINCTURES.

By E. H. Farr.

The author explained that the investigation upon which his paper was based was undertaken with a view to ascertain if the menstrua used in making the official tinctures were those most suitable for extracting the active constituents from the drugs operated upon. A number of preliminary experiments tended to prove that in many instances the alcoholic strength might with advantage be modified; and, although a large number of tinctures were experimented on, only those which are alkaloidal and tincture of digitalis were given. The numbers affixed to the tinctures stand

for volumes of absolute alcohol present in 10 of the menstruum.

The tinctures were made by the official maceration and percolation process, but the last portions of tincture were displaced with the menstruum used until the requisite volume of percolate was obtained, expression with such small quantities being out of the question. The author's observations were confined to the following points:—(1) Alkaloidal content; (2) extractive (both at 100° C.); (3) miscibility with water, as showing presence or absence of colouring, fatty, or waxy bodies; (4) miscibility with water, as showing presence or absence of mucilaginous or albuminous bodies; and (5) keeping properties. As Mayer's solution was found to be untrustworthy for estimating the alkaloids, the whole of the principles were isolated and weighed as such, except conium, which was estimated as hydrochlorate. In most cases 50 c.c. of tincture were evaporated to low bulk, a little water added towards the end, and the evaporation continued until the spirit was expelled. The residue was then acidulated and shaken with chloroform in successive portions until the latter separated colourless, when the solution was treated with excess of potassium carbonate (in the case of aconite, belladonna, henbane, and stramonium) or ammonia (in the case of colchicum, gelsemium, jaborandi, and veratrum) and shaken with chloroform in two successive portions, after which the chloroform was washed and evaporated in a tared beaker. It was found advisable, when the tincture of jaborandi was evaporated to a low bulk, to add alcohol and filter, as the excess of mucilage present formed a jelly with the chloroform and would not separate.

The following table shows the results of the examination of the tinctures:—

		Alkaloid from 50 c.c.	Extract from 5 c.c.	Miscibility vol. with 2 vols. Water	Miscibility vol. + 3 vols. Alcohol	Keeping Properties
Aconite	9	Gm. 020	Gm. 098	Opalescent	Bright	Bright, no deposit
"	7	023	144	Slightly so	"	"
"	5	020	156	Bright	Cloudy	"
"	3	018	163	"	"	Bright, with slight deposit
Belladonna	9	015	032	Slightly opalescent	Clear	Bright, slight deposit
"	7	013	067	Slightly opalescent	Opalescent	Bright, no deposit
"	5	013	072	Clear	Cloudy	Bright, slight deposit
"	3	012	073	"	"	Bright, copious deposit
Colchicum	9	004	054	Slightly cloudy	Bright	Bright, no deposit
"	7	004	085	Bright	"	"
"	5	005	094	"	"	"
"	3	004	101	"	"	"
Gelsemium	9	012	040	Slightly cloudy	"	Bright, with slight deposit
"	7	012	052	Slightly cloudy	"	"
"	5	009	057	Clear	"	"
"	3	008	049	"	"	"
Henbane	7	012	158	Cloudy	Cloudy	—
"	proof	010	166	"	"	—
"	3	010	162	Opalescent	Turbid	—
"	2	006	177	Clear	"	—
Jaborandi	9	008	104	Turbid	Bright	Bright, no deposit
"	7	009	166	Cloudy	Faint precipitate	"
"	5	020	200	Opalescent	Precipitate	"
"	3	028	207	Faintly opalescent	Dense precipitate	Deposits slightly
Stramonium	9	012	029	Opalescent	Bright	Bright, no deposit
"	7	014	029	Scarcely so	"	"
"	5	012	028	Cloudy before dilution, does not become clear	Scarcely opalescent	Cloudy, with deposit
Veratrum	3	008	025	"	"	"
"	9	036	098	Milky	Bright	Bright, no deposit
"	7	034	147	Cloudy	Slightly cloudy	Bright, slight deposit
"	5	038	154	Slightly cloudy	Slightly cloudy	Cloudy, with deposit
"	3	034	175	cloudy	cloudy	"

The special assay processes which were employed were:—

Cinchona.—50 c.c. were evaporated with water acidulated with sulphuric acid until the spirit was expelled, the volume being kept above 20 c.c.; to this an excess of soda was added, and the alkaloids extracted by shaking with two successive portions of benzolated amylic alcohol; from this solution (after washing with water to get rid of colour) the alkaloids were extracted with water acidulated with sulphuric acid. Finally, the alkaloids were precipitated with soda and extracted with chloroform mixed with a little ether to assist separation, and obtained as a reddish crystalline mass by evaporation.

Conium.—As coniine is volatile, the tincture was acidulated with sulphuric acid before being heated, and after the spirit was expelled the acid solution left was shaken with chloroform to remove colouring-matter, made alkaline with ammonia, and shaken with two successive portions of chloroform. This was washed well with water, and then well shaken with three drops of strong hydrochloric acid, allowed to evaporate spontaneously in a tared dish, and the residue dried in a desiccator until it ceased to lose weight. The salt was permanent in the bell-jar, but exposed to the air it rapidly acquired the characteristic odour of coniine. The salt was almost white, and beautifully crystalline. The crystals were polar.

Digitalis.—The residue obtained on evaporating the tincture was dissolved in warm 10-per-cent. acetic acid, then shaken with a mixture of ether and petroleum ether to remove colouring-matter. Slight excess of ammonia was then added, and the solution shaken twice with an equal volume of chloroform, which, on being washed with water and evaporated, gave a granular and almost white residue, which gave the recognised reaction of "digitalin."

Results in these Special Cases.

	Alk. 50 c.c.	Ext. 5 c.c.	1 Part with 2 of Water	1 Part with 3 of Alcohol	Keeping Properties	Remarks
Cinchona 9	·314	·232	Turbid	Clear	Deposits slightly	
" 7	·426	·283	"	Cloudy	No deposit	No. 7 appears
" + tartaric acid 1% 7	·332	·250	"	"	"	to extract the bark under no- tice best
Cinchona 5	·396	·275	"	Slightly cloudy	Deposits slightly	
Conium 9	·044	·028	Cloudy	Clear	Clear	
" 7	·043	·058	Opales- cent	Opales- cent	"	No. 7 would probably be the best
" 5	·040	·072	Clear	Cloudy	"	men- struum in this case
" 3	·022	·065	"	Slight floculent precip.	Cloudy, with slight deposit	No. 7 appears best of the four
Digitalis 7	·024	·225	Opales- cent	Cloudy	No deposit	
" proof	·020	·237	Less so	"	Slight deposit	
" 3	·016	·238	Slightly so	Less so	Deposit	
" 2	·012	·213	Clear	Least so	Copious deposit	
Opium, pow- der proof	·327	·177	Slightly cloudy	—	—	The opium results are compara- tive, but do not re- present 50 c.c. of tinc- ture. 431 was pre- sent in the opium re- presented by the tincture
" 4	·354	·214	Scarcely cloudy	—	—	
" 3	·325	·213	Bright	—	—	
" 2	·354	·198	"	—	—	
Opium, moist proof	·450	·184	—	—	—	
" 2	·459	·160	—	—	—	535 should be here present if the opium were ex- hausted

Opium.—Two sets of tincture were made—one from powdered opium containing 11·5 per cent. of morphia (B.P. method of estimation), the other from moist opium showing 10·7 per cent. of morphia. The tinctures were evaporated, and estimated by a modification of the official process. The results proved that the opium was not in any

case entirely exhausted of its morphia. The tincture made with the lowest alcoholic menstruum contained less extractive, and was only about two-fifths as dark as the B.P. one. It seemed to contain less resinous matters, and did not possess the characteristic heavy odour of laudanum to such a degree. It would probably contain less narcotine also, and it is noteworthy that this tincture did not appear to cause so much nausea as the official one. As the morphia obtained from the lower tinctures was freer from colour than the higher ones, some allowance should be made for that; and, taking all things into consideration, it is probable that No. 2 alcohol is the best menstruum for laudanum; but it was pointed out that the opium was not in any case completely exhausted of its morphia in making the tincture.

DISCUSSION.

The PRESIDENT said that the tables gave a good idea of the results, but they could convey no conception of the immense amount of work which these investigations had entailed. It was high time that the subject were handled in a thorough manner. We had been accustomed to work with rectified spirit and proof spirit, and nothing else, although we had a feeling that we were not doing what was right, for our object is to find out what is the most suitable menstruum for each drug, and the authors of the papers had placed pharmacists on the proper track.

After a few remarks from Messrs. Abraham, Conroy, and Allen regarding the strengths of the spirits used, about the relation of which there seemed to be a doubt,

Dr. SYMES said this subject of tincture menstrua was one which had often been talked about, but they had never got definite results. Some eight or ten years ago there was a discussion in his local association, and it was then thought that they ought to have a greater variety of menstrua. In his experience, three parts of spirit and one part of water gave better results than rectified spirit; this mixture was exceedingly useful, and the number of cases in which it could be used was greater. Mr. Wright showed that such a mixture gave a higher alkaloidal tincture of jaborandi than rectified spirit, but manufacturers of pilocarpine used the stronger spirit because they got the best results with it. This was a strange difference.

Mr. CRIPPS also testified to the immensity of work involved by the communications, and called attention to what might be an erroneous inference regarding proof-spirit tinctures of resinous drugs such as jalap. In this case Mr. Wright's table showed that the rectified-spirit tincture contained 9 per cent. of extractive, and the proof one 16 per cent.; but, knowing that proof spirit was not so good a solvent of resins as rectified spirit, they should not suppose that the tincture with the most extractive was the best. It might not contain so much resin, and they would require estimations of that constituent before deciding as to which was best. He would also have liked to know what were the alkaloids derived from veratrum viride, and suggested that another series of experiments should be made with other drugs, as they varied greatly in the content of extractive.

Mr. MARTINDALE was the next speaker. The work, he said, was of the greatest importance, and it almost looked as if they were beginning a new Pharmacopœia. The papers raised many questions for consideration; amongst them they might have to consider not only what menstruum should be employed, but what proportion of it to the drug. Should they have them 1 in 10, as the homeopaths were having? On the opposite side they had the fluid extracts 1 in 1, which never kept, always depositing matter which they knew not whether it was inert or otherwise; but as the object was to get permanent preparations of the drugs representing as small bulk as possible, this was the line on which they might work—viz., to find out what was best between the 1 in 1 and tincture strengths. The American Association, he noticed, proposed to try to get fluid extracts something like 1 in 2, but he hoped, when they got them, that they would not call them "tinctures." That was a title which had been reserved for a special class of preparations, and he would be sorry to see it applied to others of the nature of fluid extracts. Finally, he assured the meeting that the papers which had been read would be of the greatest service to the Pharmacopœia Committee.

Mr. CONROY then commented briefly on the papers, specially emphasising the difficulty of correctly judging the value

of the results from the figures given. This was noticeable particularly in the case of resinous drugs, it being self-evident that the more aqueous menstrua could not be so efficient as the more spirituous, as much of the matter that the former extracted was not resin.

Mr. GERRARD followed on similar lines, but he spoke chiefly regarding the alkaloidal tinctures. He could not understand, for instance, how rectified-spirit tincture of colchicum should contain as much as 9 per cent. of extractive, when the proof one contained only 12. There ought to be more in the latter case. Then there was a vast difference in the similar tinctures of belladonna, but merely a trivial difference in those of benbane, although the drugs were much alike. In the same way he contrasted Mr. Wright's figures for stramonium, and, proceeding to speak of jaborandi, he said that, as a manufacturer of pilocarpine, he had found it better to use rectified spirit for making the primary extract, not because it afforded more thorough exhaustion, but because the bulk of extractive matter to deal with was relatively small. In spite of this, he was surprised to find that Mr. Wright found only .0198 gram per oz. in the rectified-spirit tincture, and .0454 in the proof. But, independent of these criticisms, he desired to say how much pharmacists were indebted to the authors of the papers, and if they would carry their investigations further they would confer a boon upon the country.

Mr. MORRIS (Coventry), having expressed his high appreciation of the work, asked Mr. Wright what he meant by putting "nil" under proof spirit in the case of myrrh. It had often been said that this spirit would make the best tincture of myrrh, and, as there was gum in the drug, surely the spirit would extract something.

Mr. BARCLAY, JUN., questioned the value of the figures given for tincture of cinchona. His experience was that he could get more alkaloid out than Mr. Wright had got; and he thought, further, that it was improper to evaporate the cinchona with slaked lime.

Mr. HASSELBY thought the time had come when the Pharmacopœia Committee should give more room for the use of methylated spirit in the preparation of liniments. It was allowed in certain cases, and the privilege was abused to a certain extent. He had, some time ago, dispensed a prescription for a liniment with the pure spirit preparation, and it was returned to him, with much abuse, to the effect that he was an extortionist, and so forth. (Laughter.) Of course, the people had got the methylated stuff before. He advocated the addition of a little acid to the menstrua for belladonna and other drugs containing alkaloids, as had been done in the case of infusion of cinchona. It might give them much stronger preparations.

The PRESIDENT suggested that Mr. Ransom, who had worked at that subject, would give Mr. Hasselby all the information he wanted.

Mr. LINFORD then spoke about jaborandi, but we heard his remarks indistinctly. He seemed to say that he could confirm Mr. Wright's results with that drug.

Mr. MACEWAN stated that it was not surprising that the authors of the papers found that rectified spirit did not extract the alkaloids so efficiently as weaker spirit. His own experience in the case of calabar bean was that a mixture of 3 or 4 parts of rectified spirit to one of water extracted more of the active principle than rectified spirit alone, and Professor Dnnstan, when working with nux vomica, had conclusively proved the superiority of a 3 to 1 menstruum over rectified spirit.

The PRESIDENT said that was so.

Mr. WRIGHT then replied, but, as most of the points which were raised in the course of the discussion are really answered in the papers, his remarks were confined to general statements, such as the comment regarding alkaloidal tinctures, that the alkaloids exist in the drugs as salts, which are bound to be more soluble in the weaker alcoholic menstrua, so that they must extract the drugs better. He had, he found, obtained twice as much alkaloid from jaborandi as Mr. Gerrard had, and he took that as a proof that he could not be far from the truth. He agreed that it would be advisable to work again with new samples of the drugs, as they vary much. He thought it would be a hopeless task to use proof spirit for myrrh, seeing that it was universally admitted that the resin was the important ingredient. So he did not try proof spirit on it; obviously it would be

inefficient. He then proceeded to state that his results coincided with Mr. Farr's in every instance with the exception of cinchon and cinchona, and as they worked quite independently, and only knew each other's results after they had finished, it followed that some reliance could be placed on the figures. (Applause.)

The next paper was entitled

LABORATORY NOTES ON EXTRACT OF MALT, SEMI-SOLID AND LIQUID.

By John C. Umney, Pharmaceutical Chemist.

Notwithstanding that extracts of malt are by no means novel, having been used, more or less, as medicinal and dietetic substances for the past twenty years, still it cannot be said that at the present time the preparations, as met with in trade, are either uniform or satisfactory. Uniformity may be absent because no preparation has been made official in Great Britain, and it has been the custom of some manufacturers to produce these preparations with wholly unsuitable apparatus, and without due regard to the chemical properties of the constituents of malt, which make these extracts valuable as a medicinal agent. The extracts were first introduced in a liquid form, and professed to be made from malted barley entirely. They contained an appreciable quantity of alcohol, which was said to be the result of a partial fermentation, were flavoured agreeably by aromatics, and were possibly consumed as much on account of the alcohol contained in them as for the nutritive extractive of the malt itself.

The public taste, influenced by advertisements in the press, is now evidently in the direction of semi-solid extract; but such a preparation, in my opinion, is not so convenient for use, neither does it always reach the public in such a uniform condition, free from change or decomposition, as is desirable.

Suggestions have been made from time to time for perfecting these extracts, the object specially in view being to obtain a product which should contain the maximum percentage of diastase, to which its value as a dietetic substance is mainly attributed.

The difficulty of preserving semi-solid extract of malt was first pointed out as far back as 1870 by Ebert, and it continues up to the present, for extracts of high diastasic power that will keep perfectly and remain free from fermentation and acidity seem to be rare. Many of those extracts whose keeping properties are noteworthy have been rendered so by the addition of glycerine or salicylic or boracic acid, both of which acids, when present even in very small proportion, have a destructive action on the diastasic ferment. Moreover, this behaviour of all mineral and very many organic acids towards diastase should not be lost sight of in the use of the extract, and on this account physiologists state that it should be taken about two hours after a meal, when the acid of the stomach has been almost entirely exhausted in the processes of digestion.

A recent examination of trade samples shows the extreme variation in diastasic power of some of the extracts now in trade.

It may be pointed out that, according to Jungk, a good extract should convert its own weight of starch into sugar and dextrine in ten minutes at 100° F.

Sample	—	Sp. gravity at 60° F.	Diastasic power
			10 grammes of extract will convert 10 grammes of starch at 100° F. in
A	English manufacture	1.373	4 minutes
B	" "	1.405	18 minutes
C	" "	1.393	Not finished in 2 hours
D	" "	1.392	12 minutes
E	" "	1.375	Not finished in 2 hours
F	" "	1.375	4 minutes
G	German "	1.395	35 minutes
H	" "	1.410	15 minutes

Objections other than the variability of these semi-solid extracts are chiefly those of viscosity and the extreme difficulty in pouring or using an extract of such a consistency.

Experiments were made to produce a liquid preparation of

malt that would contain the full diastasic power of the grain, and at the same time be easy to take, palatable, and elegant in appearance.

I have made the following notes on the production of such a preparation, operating on a fairly large scale, using generally a quarter of malt for each operation. Five points in this manufacture deserve special attention:—

1. Selection of the malt.
2. Crushing by suitable machinery.
3. Temperature for infusion (mashing).
4. Filtration.
5. Evaporation.

The palest malt is selected for the production of the extract, as a light-coloured preparation is by far the most elegant, and has these two advantages—the one that the yield of extract from pale or amber is greater than from more highly roasted, and, consequently, deeper coloured, malt; the other, that a higher temperature may be safely employed for its infusion. This latter fact is so well known to brewers that a difference of several degrees in the temperature of the water used for mashing is always allowed between pale and deep coloured malt. The malt should be crushed only a short time—say, a few hours at the most—prior to infusion, otherwise it rapidly absorbs water, becomes neated, and consequently damaged. It has been customary to use a rapidly-rotating mill, consisting of small steel rollers, which bruise the malt and produce no appreciable quantity of flour, which is troublesome to deal with after infusion on account of its proneness to form a magma, which inevitably results if the grain be crushed too finely, and hinders not only the action of the diastase upon the starch, but also the rapid filtration of the infusion.

The temperature of the water used for the infusion or mashing (as the brewers term it) should not exceed, when using fine pale malt, a temperature of 165° F. The quantity of water used may be increased or lessened in proportion to the help that may be given to the digestion and extraction of the malt by a mechanical agitator, and also to the machinery at disposal for removing from the mass the whole of the saccharine fluid. Prior digestion of the malt in cold water, as recommended by some authorities (United States Pharmacopoeia for six hours, and the German for three hours), has been tried, but in my hands has not proved of any special advantage; on the contrary, I have come to the conclusion that, when once the process is started, the greater the acceleration of the exhaustion, filtration, and evaporation, the better the final product. The water used in the manufactures I have conducted has been that of a London water company. It is well known, however, that distilled water, or even water containing but a small proportion of calcium salts, gives a product containing less albuminoids than a water charged with lime salts, especially sulphate.

It will be found convenient to continue the mashing with agitation for not less than two hours: every opportunity for subsidence is then given, the supernatant liquor siphoned from the exhausted grain, this latter rapidly transferred to a powerful press and deprived of all moisture possible, the infusion being then filtered through suitable material by the aid of a vacuum, transferred to a pan, there boiled in vacuo, the temperature of which need never exceed 125° F.

The filtration is a most important point, and, without the aid of a vacuum filter, it would be next to impossible; and, further, unless this portion of the process be carried on most rapidly, acetification sets in and the value of the product is thereby seriously impaired.

The extract is concentrated until it reaches a specific gravity of 1.375 at 60° F., when it is withdrawn from the apparatus, transferred to a suitable vessel, and, without any delay, sufficient spirit of wine, previously diluted with water, gradually added, so that the final product shall contain 7.3 per cent. of alcohol, equal to about 15 per cent. of proof spirit by weight. It is important that the spirit be diluted and added slowly, because it is well known that strong alcohol is a ready precipitant of diastase.

The completed product will have a specific gravity when filtered of 1.250. Filtration of such a viscid fluid as liquid extract of malt is by no means easy, and it would be almost impossible to conduct the operation on a small scale, as it is all-important that the filtration shall be carried on as free as possible from atmospheric influence, if only to prevent thickening of the extract, loss of alcohol, and consequent

acetification. Finest selected pale malt will give a filtered product of about 95 per cent. by weight of fluid extract, the yield of semi-solid extract being from 75 to 80 per cent. A liquid extract prepared according to the foregoing, provided attention is paid to every detail, will give an average indication of diastasic strength equivalent to a semi-solid extract converting its own weight of starch in six minutes, which, you will judge from the table previously read, is highly satisfactory. The main reason why I have brought this fluid extract before you is, as I have previously stated, on account of the proneness to change and solidification of the semi-solid preparation, especially when low temperatures are ruling.

A liquid extract made as has been detailed (a specimen was exhibited) is elegant in appearance, possessed of maximum diastasic value, and not unpalatable. In my opinion the fluid will displace the semi-solid extracts at no very distant date.

Then followed another paper on the same subject, which was read by Mr. Naylor:—

EXTRACT OF MALT.

By D. B. Dott.

The author stated that increased importance is attached to the diastasic power of the extract, which property ought to be possessed in fair degree by a good malt extract; and it is desirable to fix a standard and to adopt a reliable method for "the estimation of diastase." He did not bind himself to the correctness of the latter expression, but the meaning of it is well known; and of the two general methods of determining the diastasic value of an extract, he thought the more accurate and reliable method is that which depends upon the estimation of the amount of glucose formed by the extract. Mr. Dott's plan is to mix 5 e.c. of a 5-per-cent. solution of the extract with 400 e.c. of a 2-per-cent. solution of arrowroot, at a temperature of 55° C. After digesting for half an hour at that temperature, 10 e.c. of a 10-per-cent. solution of soda is added, and the whole diluted to 500 e.c. This is then added to a measured quantity of boiling Fehling's solution until complete reduction takes place, and from the figures obtained it is easy to calculate the amount of maltose (two-thirds the reducing power of glucose) which is present in the solution. The reducing power of the malt-extract solution itself is next determined, and the necessary deduction made from the number first obtained, the net result showing the amount of maltose formed from the starch by diastasic action. After referring to precautions which should be taken and slight errors which may arise, the author proceeded to say that there may be difference of opinion as to what the diastasic value of malt extract ought to be; but there will be general agreement that the standard should be fairly high, and he thought that a good extract should, under the above conditions, produce not less than three times its own weight of sugar from starch, calculated on the basis that 10 e.c. of Fehling's solution are equal to .0807 gram of maltose.

DISCUSSION.

Mr. HASSELBY asked whether cod-liver oil could be incorporated with the fluid extract of malt.

Mr. CRIPPS said the paper Mr. Umney had read was full of important considerations. He could endorse, from his own experience, the great importance of rapidity of working in the preparation of the article. The temperature he employed in testing the extract was 98° F. He should like to know what temperature Mr. Umney used. At the temperature he used he found extract of malt digested its own weight in about ten or twelve minutes. Mr. Umney mentioned four or five minutes, and no doubt he used a different temperature.

Mr. GERRARD said Mr. Umney had mentioned that he added water to malt at a temperature of 165° F. That seemed to him rather a high temperature.

Mr. CONROY said he was about to ask a question on the same point. No doubt Mr. Umney relied upon the lowering of the temperature by addition to the malt. He asked him if he had tried the effect of any preservative other than proof spirit. The extract of malt was given in rather large doses to young children, and if glycerine could be used as a

preservative, instead of spirit, it would be a great advantage. Had Mr. Umney tried glycerine?

Mr. T. M. CLAGUE said they might find a preservative in some of the volatile oils that would not hinder digestion. Certain extracts of malt in the market were irritating to some patients, and caused coughing, and it appeared the irritating matters were introduced in the course of the manufacture. There were many people to whom it was a comfort to be told that there was no alcohol in the extract, and it was desirable that pharmacists should have the means of satisfying the conscientious objections of such people to the use of alcohol. (Laughter.)

Mr. S. M. BURROUGHS, at the invitation of the President, said it was a good thing that the study of malt was not to be left in the hands of brewers' chemists, whose experiments were conducted for the benefit of the brewers. He agreed with Mr. Umney that it was desirable to have the malt extract in a semi-fluid condition, so as to be easily handled. No doubt in many cases the addition of alcohol would be desirable, but where teetotallers objected to the use of alcohol the limpidity might be secured by the substitution of glycerine. Experiments which he had conducted regarding the manufacture of the extract showed that the best results were secured by mashing at a temperature of 140° instead of 165°. If the malt was heated too much the diastase was likely to be destroyed before it reached the consumer. It was very important that the sweet wort should remain long enough in the mash-tin to convert all the starch into dextrin. It should also be understood that brewer's malt should not be used for making medicinal extract of malt. The malt ought to be specially prepared, and as free from colour as possible. Green malt was exceedingly prejudicial, and always gave bad results. Another thing was that they should be careful to exclude all germs, and to get rid of them the malt should be brushed before it was mashed. If he understood the desires of the medical profession as regarded extract of malt, they were—first, that a preparation which would be a powerful aid to digestion should be secured; second, there should be sufficient dextrin to stimulate the gastric secretion; and third, it should be easily handled. He was glad there was a movement on foot to secure uniformity with respect to the diastase. On the Continent they seemed to have a poor opinion of the English extract of malt. He produced a sample of foreign extract which, the makers hoped, would drive the English extract out of the market. It was very dark in colour, and he should think it was still the custom on the Continent to evaporate in an open pan, and at a very high temperature. (Laughter.)

The PRESIDENT said that brewers' chemists were very careful to regulate the temperature of their water by the temperature of the outside air. They knew that brewers mashed at many degrees above 164°. If the malt was pale it would stand a much higher temperature than highly-dried malt. Some physiologists told them there was no value in diastase at all; and others said that it was a preparation of great value if it were taken at the proper time, viz., when the acid of the stomach had become almost exhausted—about two hours after a meal.

Mr. CRIPPS asked Mr. Umney whether he found, on adding the spirit to his aqueous extract of malt, a precipitate of albuminous matter.

Mr. UMNEY, in reply, said he did not think it would be difficult to emulsify cod-liver oil with liquid extract of malt if tragacanth was added. It emulsified easily with the semi-fluid extract. The temperature he employed for testing was 100° F., and the best samples of malt he was able to obtain converted their own weight of starch in four minutes. As to the temperature of the water used, he had been accustomed to operate with a quarter of malt at a time, and the quantity of water required for that was 150 to 160 galls. In adding the water to the malt, its temperature was reduced by 10 degrees, making it 155°. Malt, as they knew, would stand a considerably higher temperature. He had tried glycerine as a preservative, and found it answered very well. He did not know what was the cause of the irritation which had been complained of, unless it were due to the addition of salicylic acid, which he had found in some extracts. As to the precipitate of albuminous matter, he had always been careful to dilute the spirit a great deal before adding it, owing to its precipitating action on other matters besides diastase.

Mr. Naylor then read an abstract of a paper on

THE COMPARATIVE MEDICINAL VALUES OF THE THREE OFFICIAL BUCHUS.

By C. J. S. Thompson.

Infusion of buchu made from the *serratifolia* leaves often differs slightly both in colour and taste to that prepared from the *betulina* and *crenulata* leaves. The author's attention had been directed to the matter by a medical friend, and that was the origin of his note. After referring to the literature of the subject, the author gave Spica's description of the leaves of the *Barosma crenulata*. The leaf contains a volatile oil and bitter resin, the eleoptine, boiling at 204°–206° [?C.], resembling peppermint in odour. It is an isomeride of borneol, $C_{10}H_{18}O$. Assuming the therapeutic activity to depend mainly on the quantity of the volatile oil and resinous matter the leaves contain, Mr. Thompson examined a number of samples, and reported that the leaves of the *Barosma betulina* yielded an average of 4.25 per cent. of dark, olive-green, aromatic, but bitter resinous matter, having the characteristic odour of buchu, and an average of 1.45 per cent. of volatile oil, which developed after a time the strong peppermint-like odour. Samples of the *Barosma crenulata* yielded 3.75 per cent. of the resinous matter and 1.6 per cent. of the volatile oil; while *serratifolia* leaves gave 3.45 per cent. of resin, different in colour and taste, and barely 1 per cent. of volatile oil. On incineration, the leaves of the *betulina* gave an average of 4.5 per cent. of ash, *crenulata* 4.6, and *serratifolia* 5.30 per cent.

It has been suggested that the medicinal action of the leaves is due to their mucilaginous matter allaying the irritation of the mucous membrane. If this is so, then it is important to note that the *serratifolia* leaves contain less of this matter than an infusion made with either of the other official species. Obviously, therefore, the leaves of *Barosma serratifolia* are probably inferior, as regards their medicinal value, to those of *Barosma crenulata* and *B. betulina*.

DISCUSSION.

The PRESIDENT said they had always learned and thought that the *serratifolia*, or the long leaf, was by far the strongest. Now they learned that they had been mistaken, and that the short thick leaf was more powerful. It only showed the necessity of investigating these matters, and not accepting what they had been accustomed to read, and what had been copied from one text-book into another.

Mr. GERRARD said he should have liked to ask the author of the paper, if he had been present, what was the active principle of buchu. (Laughter.)

Mr. MARTINDALE said there was more mucilaginous matter in *serratifolia*, and on that the property must depend.

Mr. Naylor then gave a brief extract of a note on

SYRUP OF HYPOPHOSPHITE OF IRON.

By J. Macintyre.

This is an unstable syrup, rapidly becoming opalescent. The author tried various things to prevent this: hypophosphorous acid did not do it; but citric acid, in the proportion of a quarter of a grain to the ounce kept it permanently clear.

Mr. LINFORD said there was no difficulty in keeping the syrup clear—there were half-a-dozen ways of doing that. He had had the best results by making the solution of the iron salt by the method suggested by Mr. Martindale—viz., to dissolve iron wire in hypophosphorous acid, and store it in full bottles with waxed corks.

Mr. ABRAHAM said the citric acid hides the change, but does not prevent it.

The following papers, which we print in abstract, were taken as read, the President expressing the thanks of the Conference to the authors:—

CHEMICAL NOTES ON MANNA.

By David Hooper.

The author of this paper explained what manna are, how produced, and what their chief chemical constituents are. A great deal of manna is produced in the East, and many varieties are extensively used in India as medicines. He then proceeded to describe the chemical constituents of

B.P. manna, which are—mannite, 70 to 80 per cent.; dextro-glucose, 16 to 20 per cent.; and moisture, 10 per cent. Following this he gave descriptions of the principal Indian and Persian mannas. The first of these, obtained from *Cotoneaster nummularia*, is known in India as "Shirkhist," and is alluded to in "Pharmacographia." According to Raby (*Union Pharm.*, May, 1889), an authentic specimen from Persia yielded 8.3 per cent. of glucose, 4.1 per cent. of cane-sugar, or an analogous sucrose, and about 50 per cent. of a new sugar, *Chirkhestite*, $C_6H_{11}O_6$, apparently belonging to the mannite group, which melts at 112° [? F.], slightly effects polarised light, and dissolves in less than half its weight of cold water. It is related to sorbite. Mr. Hooper himself has examined a specimen of this manna obtained from the Central Provinces, but of an unknown botanical source. It was in whitish masses, with a stratified crystalline fracture, sweetish to the taste, and with an odour of ordinary manna. Some hard white crystals of a body of the "mannite" type separated from it melted at not below 160° .

"The manna of the desert," or taranjabin, was next referred to. It is obtained in Kurdistan, Persia, and Afghanistan, from the *Alhagi Maurorum*, Desr., and *A. camelorum*, Fisch., and contains melezitose, cane sugar, and dextrogyre glucose. Melizitose was fully described. Another manna, named *Bidenquebine*, is said to be derived from the leaves and young branches of a willow in Persia, which also yields a principal sugar resembling melezitose, but Raby calls it "bidenquebinose."

Passing on to eucalyptus manna, Mr. Hooper stated that a shower of it fell during the last dry weather from a large tree growing in his garden. The manna formed on the top-most branches of the tree at the base of the leaf-stalks, and after exuding in a liquid state, collected into drops, dried in the sun, and became detached when shaken by the wind. It occurred in small masses of the size of a pea, and varying in shape, opaque white in colour, soft, but not sticky, when collected in the morning before the dew had risen, and hard and brittle when dried by the sun or artificially. He examined it chemically, and the chief results, with all obtained from other specimens, are given in the appended table. Speaking of raffinose in this connection, the author stated that Berthelot has shown that raffinose extracted from cotton-seed cake and molasses is identical with melitose from the manna of the eucalyptus, and states that it is widely diffused in the vegetable kingdom. It is reported that the manufacture of sugar from cotton-seed cake is about to be instituted, the recommendation of the sugar being that it is fifteen times sweeter than cane, and twenty times sweeter than beet-sugar.

Sometimes, as Dr. Mason observes in "Burmah, its People and Natural Productions," trees which exude manna from the branches also yield gum arabic from the trunk. Mr. Hooper's own eucalyptus was exuding kino at the time the showers of manna fell. In the next part of the paper reference was made to the manna obtained from the pines and the cedars in the Himalayas. Some young branches of *Pinus excelsa* were sent to him which were covered with a manna which was whitish, opaque, soft and clammy to the touch before it was dried, odourless and sweet. The action of this pine manna towards polarised light, nitric acid, and Fehling's solution indicate a relation between it and larch manna and the manna of *Pinus Lambertiana*, but the lower rotatory power distinguishes it from the one, and the lower melting-point from the other.

All those mannas which have been mentioned are regarded as waste products in the vegetable economy; but there are other kinds which are produced through insect influence. These have by some travellers been termed manna, without any examination being made. The author had seen some of this on rhododendron leaves, the plants growing near Simla. This exudation contained 30.5 per cent of glucose or similar reducing sugar, and it had a right-handed rotation on polarised light. Other mannas of insect origin are the *Trehala*, the cocoon of an insect found in Persia, and the *Lerp Manna* of Australia. The former contains a peculiar sugar, named *Trehalose*, identical with *Mycose*, extracted from ergot of rye, and the latter consists of a dextrogyre amorphous sugar and a modification of starch. The following table shows the chief characteristics of most of the well-known vegetable concrete saccharine exudations. The solubility, it will be seen, is very variable, and it is

notable that they are all right-handed in polarised light. All the samples contain a constituent having a reducing effect upon Fehling's solution, which is here put down as glucose.

Manna	Solubility in Water	Rotation $[\alpha]_D$	M P	Glucose	Principal Sugar
Ash (<i>Fraxinus speciosa</i>) ..	1 in 5	$+44.8^\circ$	136°	17.8	Mannite
Eucalyptus ..	1 in 6	$+93.70$	122°	2.8	Mellitose
Cotoneaster ..	1 in $\frac{1}{2}$	right	112°	8.3	Shirkhestite
Willow ..	1 in $\frac{1}{2}$	right	150°	12.0	Bidenquebinose
"Harlalu" ..	1 in $\frac{1}{2}$	$+22.8^\circ$	140°	5.8	(not named)
Pinus excelsa ..	1 in $\frac{1}{2}$	$+45.7^\circ$	90°	13.5	A saccharose
Briançon (<i>P. Larix</i>) ..	1 in $\frac{1}{3}$	right	140°	—	Melezitose
Alhagi ..	1 in 3	right	140°	—	Melezitose
Oak ..	—	right	—	—	Dextro-glucose
Tamarisk ..	—	right	—	—	Dextrin
Plantain ..	—	neutral	—	82.3	Glucose

ON THE USES OF CURRY LEAVES.

By Dr. P. S. Mootooswamy, F.L.S., Tangore.

Curry leaves are obtained from the rutaceous tree, *Murraya Kanigii*, Spreng, which grows in the jungles of Southern India, and is also cultivated in gardens. The leaves are employed in native medicine, and their properties are aromatic, stomachic, stimulant, astringent, and tonic. They retain their medicinal properties even in their dried state. They are also indispensable in seasoning native curries, broths, and pepper-water for their daily consumption. The author described how such curries are prepared, and proceeded to give his experience with the leaf in the treatment of dyspepsia and diarrhoea resulting from indigestion, in allaying vomiting and purging in children, when it is employed in the following combination: Curry leaves, tamarind, neem, country gooseberry, morinda, of each 1 oz.; sweet flag and ajwain, of each 1 drachm; water, 10 oz. The dose of this is $\frac{1}{2}$ oz. twice a day. Other native uses for the leaf were referred to, the author stating that a powder composed of equal parts of seeds is given to children (3 to 5 grains in honey) in dyspeptic diarrhoea attended with flatulency. It is singular that native doctors, ignorant as they are of the therapeutic action of medicine, never combine opium or other narcotic preparation in their administration of remedies in diseases of children. Mr. J. G. Prebble has analysed curry leaves, and has obtained from them a small quantity of volatile oil resembling that obtained from the leaves of *Egyle Marmelos*; a greenish-black resin; an acid principle darkened by iron salts, but not precipitated by gelatine; and a bitter glucoside called *Kanigin*.

The Conference, which was now exceedingly well attended, many ladies being present, then entered upon the concluding proceedings. First there was the

PRESENTATION OF BOOKS

to the local Pharmaceutical Association.

Mr. NAYLOR, senior hon. secretary, said that he had great pleasure in calling attention to the fact that nine volumes, provided by the generosity of Mr. Thomas Hyde Hills, would be handed over to Mr. Branson on behalf of the local Chemists' Association. He was sure they would be glad to learn that the association had already something more than the nucleus of a library, and they had selected very wisely and well. In addition to the books provided by the fund, there were two other volumes, the gift of Mr. Thomas Hanbury, in memory of his brother, Daniel Hanbury, being that gentleman's "Science Papers," and a copy of the "Pharmacographia."

The collection of books comprised German Pharmacopœia, United States Pharmacopœia, Proctor's "Lectures on Practical Pharmacy," United States Dispensatory, Dorvault's "L'Officine," Squire's "Companion," and the National Dispensatory, all handsomely bound in leather.

The PRESIDENT said he had very great pleasure in presenting the books to Mr. Branson, the secretary of the local association; and he was quite sure the association of Leeds had done good work, and would continue to do good work, and that the books would be of service, not only to the senior members but also to the students.

Mr. WARD, for Mr. Branson, on behalf of the Leeds

Chemists' Association, said it gave him great pleasure to accept the very handsome gift which was left from year to year as a legacy of the Conference at the various towns whereto they met. He had no doubt the gift would be highly appreciated by members of the association, and they would afford, he trusted, not only to the committee, but to all the members and associates, a very pleasing memento of the Conference visit to Leeds.

The Formulary Committee was then re-elected with a vote of thanks.

CARDIFF FOR 1891.

The PRESIDENT then called upon Alderman Yoruth, of Cardiff, to address the meeting, and that gentleman, on rising, was supported by Mr. Alfred Coleman and Mr. John Munday. On behalf of the chemists and druggists of Cardiff and the vicinity, Alderman Yoruth gave the Conference a cordial "invite" to the metropolis of South Wales—the metropolis of Wales, he ventured to add, for Cardiff was a growing town. Not so many years ago it had a population of 30,000; now it had 130,000, and the finest docks in the country. The Barry Dock, which was close to it, was beyond dispute the finest dock in the world. There were other things about Cardiff which would be attractive to the members: they had a romantically-situated castle, and several nice places which could be visited, and he assured the meeting that the Cardiff folk would give them a hearty, thorough, good welcome. They would, in short, do their best to make their visit as pleasant as any they had had at any place in the country. He would not say that they would exceed Leeds, but they would try not to be behind. (Applause.)

When the Alderman sat down there were loud cries for Mr. Alfred Coleman, whose plucky fight at the last Pharmaceutical Council election has apparently made him a marked man; and he, in response, said he cordially supported the invitation given by Alderman Yoruth. Ten years ago the Conference had visited Swansea, and he hoped that the Conference would now give Cardiff a turn, for he was sure that they would get a good welcome.

Mr. S. TAYLOR (Leeds) moved that the invitation be accepted.

Mr. RIDDLE (Hexham) seconded the motion. Cardiff, he said, was a place that interested them all, especially north-countrymen, with whom Cardiff competed in the coal line; so that they would be glad to go there to see what their competitors were like. (Laughter.)

The motion was approved with acclamation; and the PRESIDENT said that the members of the Conference would have great pleasure in visiting a town which had developed with such great rapidity.

BRITISH ASSOCIATION AND THE CONFERENCE.

Before resuming his seat, the PRESIDENT said he had received a telegram regarding the meeting in 1892. It was from Mr. Wm. Gilmour, chairman of the executive of the North British Branch, who, on behalf of the executive and the chemists of Edinburgh and district, extended a cordial invitation for the Conference to meet there in 1892, it being understood that the British Association will meet there. The Conference executive, the President explained, had on the previous evening had this matter under discussion. The question was whether, after twenty-seven years' existence, they could not venture to visit places on their own initiative, and by themselves. (Loud "hear, hears" and "noes.") He was glad to hear the noes, for there was a good deal to be said on both sides. The British Medical Association was independent in this matter of where its annual meetings should be held; and, although he did not wish to seem ungrateful to the British Association for the courtesies extended to the Conference, he thought it would be wise of the members to consider during the current year how they should act in future. Should they meet earlier in the summer, or at the same town as the British Association, but a week earlier? They might take up the matter in earnest, and he suggested that a discussion of it in the journals would help to bring them to some definite understanding.

ELECTION OF OFFICE-BEARERS.

Mr. NAYLOR then read the following list, which had been exposed on the blackboard all the afternoon. He had got

no further than Mr. Martindale's name, when such a storm of applause ensued that it was some minutes before he could proceed:—

President, Wm. Martindale, F.I.C.; Vice-presidents, M. Carteighe, A. Kinninmont, J. C. Thresh, D.Sc., and J. Munday; Hon. Treasurer, R. H. Davies; Hon. Secs., W. A. H. Naylor and F. Ransom; Members of Committee, Professor Green, A. W. Gerrard, W. Kirkby, D. B. Dott, N. H. Martin, E. M. Holmes, F. W. Branson, Ward (Leeds), and Alderman Yoruth; Hon. Local Sec., Alfred Coleman; Auditors, David Anthony, and Edwin Yewdall.

VOTES OF THANKS.

Mr. SCHACHT proposed that the cordial thanks of the non-resident members of the Pharmaceutical Conference be given to the local committee and especially to Messrs. Branson, Ward, Taylor and Bowman, for the very successful manner in which all the arrangements connected with our visit to Leeds have been carried out. (Cheers.) He said he was very pleased to be the mouthpiece of those who did not belong to the locality in thanking the local committee for the arrangements they had made for their comfort and the pursuit of their business at that meeting. (Cheers.) He did not forget that the labours of the local committee were not quite ended, but that was the last occasion which they would have of thus formally recognising them, and this would, therefore, be an expression of gratitude for favours to come as well as of thanks for those which were now matters of history. (Hear, hear.) He also wished them to thank especially the lady pharmacists for the arrangements they had made on behalf of the ladies. (Cheers.)

Mr. KINNINMONT seconded the motion. On behalf of his compatriots he wished to thank the committee, and especially Mr. Branson, for the admirable arrangements they had made. (Cheers.) He regretted that the weather had not been quite propitious, but the local committee were not to be blamed for that. He hoped the weather would second the efforts of the committee on the morrow. (Hear, hear.)

The motion was carried with acclamation.

Mr. WARD, in reply, said the committee were much obliged to them for the generous and enthusiastic vote of thanks. Their labour had been one of love, and the difficulties had melted away very nicely from the time they began their work. They received much assistance from Mr. Reynolds—(cheers)—who was almost a patriarchal pharmacist, and one of the founders of the Conference; and the secretary had been most indefatigable in his labours. (Cheers.) The committee had worked very harmoniously, and he trusted the result had been satisfactory to the Conference. Knowing Leeds was a very smoky town, the Secretary had obtained for them a specimen of it on a piece of white paper which he carried across the street in the rain to catch the carbon washed from the atmosphere—and he was going to frame it. (Laughter.) His colleague Mr. Branson suggested that to make the thing more perfect they should get a sample of the water from the river, in order to show the quality of their ink. (Laughter and cheers.)

Mr. BRANSON also replied. He said the committee had worked together harmoniously, and if the result of their labours had been successful they were gratified. (Cheers.) He hoped the Conference would meet in Leeds again in their time. (Cheers.)

Mr. TAYLOR, in a few words of reply, said his labours had been very light as treasurer. Hitherto, it had been all receiving money, but next week his duties would begin by having to pay it out. (Laughter and cheers.)

Mr. A. H. MASON moved a vote of thanks to Principal Bodington and the Council of the Yorkshire College, to the Council of the Philosophical and Literary Society, and to the Mechanics' Institute, for the courtesies which they had extended to the Conference.

This motion Mr. HODGKIN seconded, and Messrs. RICHARD REYNOLDS and EDWIN YEWALL replied; Mr. Reynolds speaking of the importance of such colleges as the Leeds one in promoting correct methods in the industries of the country, and the likelihood of their supplying efficient education when the compulsory pharmaceutical curriculum is a fact.

THANKS TO THE PRESIDENT.

Mr. ATKINS said he had a resolution to propose, which, he was sure, they would agree was a very important, as well as a most interesting one. He was only sorry that time warned him that what he had to say must be put in the shortest possible terms. The resolution he had to propose was, "That the hearty"—he would say, "The heartiest"—"That the heartiest thanks of the Conference be accorded to the President for the very able and courteous manner in which he has conducted the business of the meeting." (Cheers.) He had a wish to supplement that resolution with one or two words of commendation as well as comment. Mr. Umney was, to his mind, a typical President of such a Conference as that. (Cheers.) He was for this threefold reason: He was a man of science, he was a man of business, and he was a courteous friend. (Cheers.) When they had these three qualities or qualifications rolled up—

country, and for his own part he had seen much more of the country by attending the meetings of the Conference than he should otherwise have done. (Cheers.)

The motion was carried by acclamation.

The PRESIDENT, in replying, thanked them for the support they had given him, not only there, but in the previous Conference at Newcastle. He was particularly indebted to his colleagues on the committee for the thought and the time they had always been ready to place at his disposal for carrying on the affairs of the Conference during the two years he had been President. He would also like to thank the local committee for the very excellent arrangements they had made, and for the excellent buildings they had put them in. He had attended the meetings of the Conference for 25 years, and never remembered their meeting in such a building as that. (Cheers.) They were also indebted to Mr. Yewdall, and Mr. Reynolds, for the other buildings which had been placed at their disposal. (Cheers.) He



LAKE IN ROUNDHAY PARK.

as they had in Mr. Umney, fortunately for Leeds, fortunately for the Conference, and fortunately for the interest and the confirmation of the well-being of the institution—fortunate were they in securing such a president. (Hear, hear.) He ventured to affirm positively, and he was sure he had the assent of the meeting to this statement, that they had had from Mr. Umney an address commendable for brevity, of pointed interest, and that Mr. Umney had introduced the papers and conducted the business in a happy form. He asked them, therefore, to pass this resolution with the greatest possible acclamation. (Loud cheers.)

Mr. MARTINDALE seconded the motion. He said he had known Mr. Umney for nearly thirty years; they were fellow-students, and he had always found him a faithful friend, and he felt that he should have a difficult task to follow him as president after the manner he had conducted the business for the past two years. He was sure gallant little Walcs would do its best, and he should be glad to welcome at Cardiff as many of them as could possibly come from that district. (Cheers.) It was a good thing that the Conference was a peregrinating body. They went about the

thanked the ladies for their attendance, and said he always liked to see them present, because they could not get on without them. It had been a great pleasure to him to come there amongst so many old friends, such as Mr. Reynolds and Mr. Schacht, and others, who were grey-headed when he began attending the Conference 25 years ago. (Cheers.)

This concluded the proceedings, and most of the members at once proceeded on a

DRIVE TO ROUNDHAY PARK.

The large party, which included a number of the fairer sex, mounted the brakes which were at the doors of the Philosophical Hall. The drive was through the famous Briggate, and by Sheepscar into the hilly and well-wooded country around the town. After a three-miles drive, the company reached the park, which consists of a splendid estate, the property of the Leeds Corporation, ranging over hill and dale for a considerable distance; and skirting one of the two extensive lakes, the waggonettes drove up to "The Mansion," where a truly Yorkshire tea was provided. The view from the windows of the mansion, which stands on one of the

highest points, was very much enjoyed. As time pressed for those who wished to take part in the opening ceremony at the British Association, tea was quickly despatched, and the return journey was commenced immediately after tea, the party reaching Leeds in good time after an enjoyable and interesting drive of two hours' duration.

THE SMOKING-CONCERT.

About 9 P.M. the same evening smokers began to assemble at the Queen's Hotel, and notwithstanding the various attractions in the way of theatres, &c., a goodly number foregathered. In a very little time the atmosphere of Leeds was considerably blackened by the fumes from some hundred tiny crucibles in which British pharmacists were experimenting on the field of inorganic matter from the leaf of *Nicotiana tabacum*. Most of the savants of the Conference were present, and with Messrs. Davies, Wells, Hodgkin, Strother, Maitland, Thompson, and many others on the field of song, the fun was kept up heartily till a late hour, a feature of the lively evening being a duet by the President and his son (Mr. J. C. Umney). Later in the evening the members who had been at the British Association meeting strolled in, and a crowded attendance saw the close of a most interesting "smoker."

WHO WERE THERE.

The following are the names of those who signed the attendance-book:—

Abraham, A. C., Liverpool	Green, Prof. J. R., London
Allen, C. B., London	Groves, T. B., Weymouth.
Archer, J. S., Guiseley	Gwynnell, E., Woolwich
Allen, A. H., Sheffield	Hall, H. E., London
Archer, W., Guiseley	Hardman, F. W., Leeds
Atkins, S. R., Salisbury	Harrison, L. A., Harrow
Barelay, J., Birmingham	Hasselby, T. J., Donecaster
Baxter, G., Chester	Hodgkin, J., London
Bain, J., Liverpool	Holdin, J., London
Bayley, G. H., Saltaire	Hopkin, W. K., London
Bird, F. C. J., London	Hudson, T. H., Liverpool
ell, E. E., Swaffham, Norfolk	Hughes, J., Swansea
Beggs, G. D., Ireland	Hutchen —, Bonnyriggs
Berry, W., Bristol	Jackson, Dr. N. A., Manchester
enger, F. B., Manchester	Jefferson, P., Leeds
Boyce, F., Leeds	Johnson, T., Wigan
Bishop, G. T., London	Johnston, J., Aberdeen
Botbamley, C. H., Leeds	Potter, H., London
Bell, C. B., Hull	Kay, J. P., Aberdeen
Bottle, A., Dover	King, Letitia, Ripon
Broadbent, J. B., Hanley	King, Leavens, Ripon
Brown, Miss, Dublin	Kershaw, A. N., Keighley
Bowman, W. P., Leeds	Kirk, J. M., Doneaster
Broadbent, H., Leeds	Kirkby, W., Manchester
Burroughs, S. M., London	Kinnimont, A., Glasgow
Bremridge, R., London	Knott, S., M.B., London
Butler, E. H., Leicester	Lee, S. W., Liverpool
Branson, F. W., Leeds	Leigh, M., Brighton
Balmforth, A., Manchester	Long, H., London
Chaplin, J. L., Wakefield	Macadam, S., Edinburgh
Clarke, J. G., London	MaeEwan, Peter, London
Clague, T. M., Newcastle-on-Tyne	Maitland, P. L., London
Conroy, M., Liverpool	Martin, N. H., Newcastle-on-Tyne
Corder, O., Norwich	Martindale, W., London
Collier, H., London	" Mrs., London
Cole, E. H., Leeds	Mason, A. H., London
Clark, J. W., Leicester	Maudson, R. T., Leeds
Coleman, A., Cardiff	Mathews, J. H., London
Clark, J., York	Miles, C. J., London
Crawshaw, E., London	Morris, J., Coventry
Cripps, R., Birmingham	Morris, M. E., Hartlepool
Chaplin, P. A., Wakefield	Morrison, C. O., Sheffield
Cross, W. G., Sbrewsbury	Munday, J., Cardiff
Dyer, W. B., Halifax	Murphy, A. J., Leeds
Davies, R. H., London	Naylor, W. A. H., London
Dyson, H. B., London	Newsholme, O. T. W., Sheffield
Evans, W. J., New York	Nightingale, T. C., London
Fairley, T., Leeds	Parkin, J. B. and Mrs., Ripon
Forbes, T. W., Bolton	Pettingor, E., London
Foggan, G., Bedlington	Parkinson, R., Liverpool
Frazer, D., Glasgow	Passmore, F., London
Garrett, T. P., Newport, Mon.	Patchett, E. C., Nottingham
Gerrard, A. W., London	Pollitt, W. B., Leeds
Glazier, W., London	Rankon, C., Sunderland
Grose, N. M., Swansea	Reynolds, R., Leeds

Richmond, R., Leighton Buzzard
 Riddell, W. R., Hexham
 Rupertson, A., Sheffield
 Ransom, T., Hitchin
 Savage, W. D., Brighton
 Sangster, A., London
 Schaecht, G. F., Clifton
 Simpson, H. D., Louth
 Shepherd, J. W., Settle
 Stephens, S., Huddersfield
 Stiles, M. H., Doncaster
 Strother, C. J., London
 Symes, C., Liverpool
 Thresh, J. C., Chelmsford
 " Mrs. "
 Taylor, G. S., London
 " S., "
 Thompson, M., London
 Tingle, J. G., London
 Thompson, G., Knaresboro'
 Towerzey, A. A., Clifton

Tompsett, L. S., London
 Umney, C., London
 " J. C. "
 Ward, G., Leeds
 " S., Dewsbury
 Wells, W. F., Jun., Dublin
 " Mrs. W. F. "
 Watkinson, J. W., Farnworth
 Watts, R., Sheffield
 West, W., Bradford
 Williams, T. H., London
 Wink, J. A., London
 Whysall, W., Grantham
 Worfolk, G. W., Ilkley
 Westmoreland, J. W., Leeds
 Wright, R., Baxton
 " T. R., London
 Wootton, A. C., London
 Wellings, W., Liverpool
 Yewdall, E., Leeds
 Yorath, T. C., Carliff

There were a good many present who did not sign the book.

THE EXCURSION.

AT 9.30 A.M. on Thursday a party of ladies and gentlemen, numbering 150, assembled at the Midland Station to take part in the arranged excursion to Wharfedale. The weather was rather threatening. At a quarter to ten the special saloon train steamed out of the Leeds station, and after a speedy run of forty minutes, passing on the way Kirkstall Abbey and other delightful places of health resort in the lovely valley of the Wharfe, the pharmacists and their friends were safely deposited at Embsay, having meanwhile escaped a sharp shower. Waggonettes here



THE STRID.

awaited the party, and a most enjoyable drive followed, for the weather had by this time improved. Crossing the rising lands of Embsay Moor, the route lay in the direction of Barden Tower, whence magnificent views of the heights of the Pennine Range were obtained, the well-known peaks Wharfedale and Penygant standing away to the north some ten to fifteen miles distant. Leaving Barden on foot, the road again ran along the banks of the Wharfe, through the charming Bolton wood, to the Strid, where the drive was

resumed in an easterly direction to Bolton Abbey, once the home of the Lords of Clifford; and here, after a delightful morning, the party retired for lunch, which was served at the Devonshire Hotel.



BARDEN TOWER.

After luncheon Mr. C. UMNEY said he had a pleasing duty to perform in thanking the local Committee for the excellent arrangements which they had made for the Conference during the visit, and also expressed his personal thanks to his excellent secretaries, Messrs. Naylor and Ransom, for their very great assistance during his occupancy of the president's chair. Nor could he forget the help which they had received from the press, members of whom he saw present. He thanked very heartily all those who by their kindness had added to the pleasure of the Conference visit. The reception was one of the best he remembered in the course of the twenty-five years he had attended the meetings. He coupled these sentiments with the names of Mr. W. A. H. Naylor and Messrs. Ward and Branson (Leeds).



KIRKSTALL ABBEY.

Mr. WARD, in replying, said that he and his colleagues on the local committee were highly gratified by the Conference's visit to Leeds, for they so much appreciated the objects of the Conference that it was a pleasure to them to work out the arrangements which, he was glad to hear, had met with their approval and approbation. In concluding, Mr. Ward proposed "Success to the British Pharmaceutical Conference," coupling with it the name of Mr. S. R. Atkins, a past president.

Mr. BRANSON said he was very glad the Conference meeting at Leeds had been a success. He and the local committee were very much obliged for the hearty vote of thanks by which the members present had acknowledged their efforts.

Mr. ATKINS also expressed his thanks for the cordial way in which the toast of the British Pharmaceutical Conference had been received. Whatever might be the advantages of scientific gatherings—and he believed they were very great—the meetings would be deficient in completeness without this final social gathering. If any class in the world needed the charm and enjoyment of such excursions, it was hard-working pharmacists. He hoped this feature of the Conferences would be maintained.

Mr. MARTINDALE was loudly called for, but he limited his remarks to a declaration that he would be pleased to meet all present at Cardiff next year.

Mr. CORDER proposed "The Ladies" in a happy speech.

They were declared by the company to be "jolly good fellows," and this ended the oratory.

Thereafter the company visited the Abbey, which was first founded at Embsay in 1120, and removed to Bolton thirty years later. Here the vicar received the party, and, after an organ voluntary in a renewed part of the Abbey, he gave an interesting account of, and conducted the visitors over, the Abbey ruins, and the charming woods and scenery adjacent. On the banks of the Wharfe, just outside the Abbey, the party was photographed in a slight shower of rain. Then



BOLTON ABBEY.

the journey was resumed to the station, whence a special train took them to Ilkley, which was reached in time for five o'clock tea, served in the winter gardens of the Wells House Hydropathic. The grounds of this establishment were inspected, and the company returned by train to Leeds, which was reached only a few minutes after seven.

Personalities.

MR. DAVID STORRAR has consented to deliver the inaugural address to the Dundee Chemists' Assistants' Association on October 9.

MR. A. GOVAN REID, formerly of Stornoway, has arranged with Messrs. Guyer & Shapley, of Torquay, to take over their branch business at Cockington.

MR. ERNEST J. PARRY, son of Mr. W. J. Parry, the head of the firm of Bartlett, Hooper & Co., 134 Upper Thames Street, E.C., has passed the intermediate examination for B.Sc. Lond., in the first division.

A GLASGOW CHEMIST'S PERSONALTY.—According to an inventory recorded recently in the books of the Sheriff-Clerk of Lanarkshire, the personal estate of the late Mr. John Edgar Poynter, manufacturing chemist, Glasgow and Greenock, who had residences at 167 Bath Street, Glasgow, and Clydeneuck, Uddingston, amounts to 78,104*l.* 10*s.* 10*d.*

MR. HERBERT SCOTT, who has carried on business as a chemist in Budleigh Salterton for close upon fifty years, was presented on August 23 with a purse of 54*l.*, collected by public subscription as a mark of respect towards a very old inhabitant of the town. Mr. Scott is about to leave the town consequent upon continued ill-health.

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IMPORTANT TO CHEMISTS.

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SEE PAGE 18.

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EDITORIAL NOTES.

THE CONFERENCE WORK.

WITH a list of papers a little more than double what was
anticipated at the outset the work of the Conference on
Tuesday morning seemed greater than could be overtaken in
the time at the disposal of the members; but it must be
confessed that several of the subjects which were brought

before the meeting were somewhat deficient in importance. The papers involve such an amount of reading and study that we feel that few chemists will venture to attack them after supper on Saturday evening, and for their benefit we give here a concise descriptive report and commentary upon the papers and discussion, which contain the principal facts which were elicited. The Executive had a sound appreciation of the merits of the communications when they placed Mr. Gerrard's note on the alkaloidal value

of three kinds of henbane—viz., first and second year's biennial, and the annual leaf—first on the list. Mr. Gerrard obtained specimens of these from different parts of the country, made spirit-extracts of them, and isolated the alkaloids from these extracts—the result being that practically the same quantities of alkaloids were obtained from all three kinds of leaf. Obviously the preference for the expensive biennial leaf and flowering tops is based on nothing but prejudice. It might be said that some good reason must be behind the custom of using the biennial, but the fact is that the custom is not established. Mr. William Gilmour showed, in a paper which we published in 1883, that authorities and pharmacopœias are at variance about the matter, and Mr. Gerrard corroborates him bibliographically, adding the most weighty argument of all—viz., that the one leaf is as good as the other, so far as active principle is concerned. Another point—perhaps the most important in the paper—was the attention given to the root, which was shown to be twice the strength of the leaf, and a more desirable drug, especially for the preparation of an alcoholic extract. This root can be obtained in large quantities, and is at present unutilised. The first year's root is the better, as during the second year it shrivels up and becomes almost useless. The discussion on this paper was very much to the point. In the course of it Mr. Gilmour's communication to this journal was referred to in complimentary terms, and the cultivation of henbane by pharmacists was a topic not lost sight of. Several speakers were disposed to disagree with Mr. Gerrard's conclusions regarding the alkaloidal strength of the drug; but this was owing to a misconception, and it may be said that the statements in the paper were accepted without qualification. The only thing which is likely to prevent the exclusion of the biennial leaf in preference to that of the annual variety of henbane is that the latter does not possess exactly the same odour as the former, and it is also not so rich in resinous principle. How far these considerations should influence the adoption of Mr. Gerrard's suggestion it is difficult to compute; for no physiologist is likely to trouble himself experimenting with principles known to be as inert as henbane is active, the activity of the drug being unquestionably due to its alkaloids. In short, it seems that we have an opening here for a substantial and economical improvement, and, like all improvements, it can only be effected by one bold stroke. In connection with this subject we may call attention here to two interesting letters which we publish this week regarding the growth of henbane. The next paper—viz., that by Mr. C. H. Bothamley on alkaline sulphites—was

made exceedingly interesting by the manner in which it was read. Mr. Bothamley spoke of normal sulphites, acid sulphites or bisulphites, and the so-called meta-bisulphites. He showed that the commercial samples of normal sulphite of sodium are generally of passable quality. As to the bisulphite, although the theoretical amount of real SO_2 which the salt contains is 61.54 per cent., the amount actually found was only from 8.1 to 39 per cent., whereas the meta-bisulphite contained from 52.54 to 65.6 per cent., the

theoretical amount being 67.37 per cent. The author accordingly recommended the use of the last-named salt for laboratory and other purposes, since it is more stable. Mr. Bothamley is, we believe, an ardent photographer, and his experience in prosecuting that art was really at the bottom of his communication; but none of those who spoke on the subject appeared to know how important alkaline "meta-bisulphites" have become in photography, so that to a certain extent the paper missed fire, and we were treated to discursive remarks on disinfecting and the like. Otherwise the discussion gave origin to nothing startlingly new. Following this was a communication on a subject of a widely different

nature—viz., the history of and means for identifying true *strophanthus* seeds. Mr. E. M. Holmes was the author of the paper, which was

read, in his absence, by one of the secretaries. What we want to get at in regard to this drug is—what did Prof. Fraser use in the prolonged therapeutical research which was the means of giving *strophanthus* a permanent place in medicine? To that Mr. Holmes replies that, although at first the seed was supposed to be obtained from *S. hispidus*, all the evidence now shows that a different plant yields it, and it is safe to call the plant *S. hispidus*, var. *Kombe*, or we may even call it *S. Kombe*; but that is not very important. To commercial men he gives this short rule for guidance—true *strophanthus* seed comes from East Africa. *Ergo*, avoid the West African seed. For those who can appreciate botanical characteristics the author added precise information regarding the appearance of the true seeds and the false. These we need not attempt to summarise here, but we may say the paper carried the conviction with it that the writer knew what he was speaking about, and we take it that Mr. Holmes's description should form the standard for the future. We have already stated that there is great confusion in commercial circles regarding *strophanthus* seed, and from what the President said we gather that this confusion has extended to the Pharmacopœia Committee, so that the paper is opportune. Following this, Dr. Thresh read a paper

on "The Estimation of Nitrites in Potable Waters," which he treated differently from what he has done in recent papers, for, instead of measuring the volume of gas produced by interaction of the nitrites and hydriodic acid, he proposed to estimate the amount of nitrites by judging of the colour produced by iodine freed in the reaction in presence of starch. The test, therefore, becomes a kind of Nesslerising, and for it there are required a standard nitrite, a solution of starch and alkaline iodide, and a dilute acid, for all of which Dr. Thresh gave formulæ and full explanation of the working, with examples of the results. Incidentally he spoke of the presence of nitrites in water, and the scope there is for investigation regarding it. He had noticed that some samples so contaminated showed a very different character from day to day, and he imagined that bacterial life had something to do with this. In the discussion, after some references to the soft moorland water of Yorkshire towns (a subject which is perfectly perennial), Mr. Siebold startled the meeting by taking up the bacterial topic and stating that he had evidence that some waters of this character contain ptomaines. In an extempore speech it is, perhaps, not possible to give all data upon which assertions are made, and this, it struck us, was Mr. Siebold's position; but it is somewhat difficult to conceive how nitrification can proceed in the same medium wherein ptomaines are formed. Perhaps the processes may go on alternately, and so account for the appearance and disappearance of nitrite. By the way, in the course of this discussion Mr. Barclay, jun., of Birmingham, made his *début*, mentioning that he examined the other day

two samples of water from the same source—one delivered by a lead pipe, the other by a zinc one; the former contained nitrite, the latter did not. In the discussion the real subject of the paper was lost sight of.

At this stage the Conference adjourned for luncheon, and on resuming, two papers on the use of chloroform as a preservative were read. In the first of these Mr. J. F. Burnett had very little to say which was not mainly a corroboration of what he published three years ago. In the interval he had found that the quantity of chloroform required to preserve official infusions is so large as to exclude its use for this purpose; but concentrated preparations require very little more, and, as they have to be diluted, the physiological objection does not apply in this case. Mr. Harold Wyatt, in the second paper, went over much the same lines, speaking of the use of chloroform in stock solutions, especially those of organic substances, such as ergot, alkaloids, &c., but he added that he had had very good results in preserving fruit-juices, raspberry juice requiring 1 in 600, which distinctly improves the aroma, while for essence of rennet chloroform has proved in his hands to have a wonderful preservative influence. In other directions it has also been found to be useful. The discussion which followed this paper completely justified our suggestion of a fortnight ago—that it is desirable to have subjects brought before the Conference which come under galenical pharmacy. The discussion was general—that is to say, more than half-a-dozen speakers took part in it, and they had all something to give from personal experience. It was interesting and instructive, fully confirming the opinions of the authors of the papers. We need not attempt to summarise what was said, but two points may be emphasised—as a preservative for fresh fruit the unobjectionable nature of chloroform is not established, but for galenical preparations it is successful all round.

Two papers on glycerine were then read. The first, by Dr. Lewkowitsch, originated from the paper and discussion of last year's Conference, and the second was a supplementary paper by Mr. Louis Siebold. In his paper Dr. Lewkowitsch, as chemist to a soap-manufacturer, and therefore one well acquainted with the manufacture of glycerine, did not deny the presence of arsenic in glycerine—indeed, he admitted that it was a common contamination, and stated that it arose from the use of impure sulphuric acid in the process of manufacture. He conjectures that arsenic is in the glycerine as an arsenical ether and glycerol, so that it is impossible to remove it even by distillation, and that the only way to avoid the presence of arsenic is to use pure reagents in its manufacture. He had succeeded in preparing arsenic from soap-lees on the large scale, which was free from objection, and samples were submitted to the meeting. The author added many important facts regarding the characteristics and tests of glycerine, especially in regard to the limit of ash and organic matter other than glycerine which may be admitted in medicinally pure samples. The ash consists mainly of iron, and exists only in infinitesimal quantities. As an offset to the statements regarding the impossibility of freeing arsenical glycerine from arsenic, Mr. Siebold's paper was in one sense amusing. Taking advantage of the idea involved in the treatment of arsenical poisoning with freshly precipitated ferric hydroxide, Mr. Siebold thought he might try this body on arsenical glycerine, and when he mixed the glycerine with its own volume of water and shook it up with the alcohol hydroxide, and filtered, he found that the filtrate was quite free from arsenic. The discussion on the paper conveyed a great deal more than was actually said. It transpired, for example, that glycerine is not uncommonly

contaminated with iron, which does not appear to be derived from tin vessels, for manufacturers state that glycerine should not be allowed to remain long in iron drums for fear it should be contaminated with iron. It is difficult to reconcile Mr. Siebold's statement that the glycerine does not dissolve ferric hydrate and the manufacturers' statement that iron drums give iron to the glycerine. The manufacturers' statement is partly a blind, the fact being that they use ferric hydroxide to free the glycerine from arsenic. Dr. Lewkowitsch said nothing upon this point, but there can be no doubt that the two papers are of considerable importance, and will help to remove the suspicion which is attached to this much-used substance. Following this paper, Mr. Siebold gave the

Strychnine Antidotes. meeting an account of some experiments which he has conducted upon himself as to the efficacy or otherwise of the commonly used antidotes for strychnine. Tannin he found to be valueless, animal charcoal had some effect, chloral and chloroform had more, and hypodermic injections of morphia were also useful. There was considerable discussion on this communication, but it really brought out no suggestions of value, and the President—wisely, we think—after it had proceeded to some length, suggested that it was taking up topics upon which the members as pharmacists could not be considered authorities.

Mr. R. H. Davies, in his paper on the compound of mercuric chloride and caffeine, showed that in comparatively weak aqueous solutions of the alkaloid and its "citrate" a saturated solution of mercuric chloride produces in time a precipitate, while in stronger solutions of the alkaloid (1 in 200) a crystalline precipitate is produced at once. This is a beautifully crystalline [silky-white solid, which Mr. Davies has found to be that which we mentioned last week. A few remarks were made upon the paper, but nothing that is not generally known.

The last paper read on Tuesday was the one communicated by Messrs. Millard and Stark on the tests for methylated spirit, which was a first instalment of a series. The paper, therefore, comprised a *resumé* of the literature on the subject, but it only dealt with five tests—viz., Emerson Reynolds's one, which depends upon the reaction of acetone with caustic potash and mercuric chloride; Cazeneuve's test, which depends on the reduction of potassium permanganate, and of which they proposed a modification, wherein the time taken for the disappearance of the violet colour determines the result. The third test mentioned was Riche and Bardy's methyl-aniline violet one, in connection with which they gave silk the preference to wool. Then followed a description of J. T. Miller's formate of silver test; and, lastly, Hehner's bichromate oxidation test. Preference was given to the second named. Finally the authors indulged in some criticism of fiscal questions, especially the use of methylated and denatured spirit in pharmacy. The paper undoubtedly is a welcome contribution to the literature of this subject, but as it came at the end of the day's proceedings, and was abstracted, the discussion was brought within narrow compass; however, in the short time at his disposal Mr. Linford succeeded in showing that the Dutch Pharmacopœia iodoform test is an exceedingly sensitive and reliable one.

On resuming work on Wednesday morning the list of papers had further extended, the number being twenty-eight; and the first of these which was read was on the bark of *Oroxylum indicum*, regarding which Mr. E. M. Holmes gave a description similar to what we gave last week. To these we append a somewhat fuller description than was gathered

from the abstract of the paper which was read to the meeting. Following this, Mr. Naylor read the report on the chemistry of this bark by himself and Mr. Chaplin. This showed that the authors had isolated certain proximate principles from the bark—viz., a crystalline fat; a wax; a crystalline acrid principle, of the nature of a fatty acid, to which he attributed the acrid taste; a golden-yellow crystalline principle, for which they suggest the name *oroxylin*: it is soluble in ether and similar solvents, is not an alkaloid, and yet does not appear to be a glucoside. Further work is being done with it, in order to obtain more particulars about its nature and composition. In addition to these substances, citric acid was found in the bark, as well as chlorophyll; an astringent substance differing from tannin in not precipitating gelatine; Fehling-reducing and pectinous substances, and extractive matter. The latter paper involved a great deal of work, of which little idea can be got from the record made. There was practically no discussion on the papers, and the Conference proceeded to the one communicated by Mr. William Martindale and his assistant, Mr. Appleton Salter, on the composition and preparation of green

Hydrarg.**Iodidum****Viride.**

iodide of mercury. The authors reported that they found that when the salt is made by trituration of mercury and iodine, the former about 13 per cent. in excess, and damping with rectified spirit, the product is wonderfully stable, especially when made in small quantities and stored in amber glass bottles kept in the dark. Pills of the iodide should also be kept in amber glass bottles. The discussion which followed this paper was a long and interesting one, which we may summarise under three sections. First, the desirability of having an official standard for the salt. The balance of opinion was decidedly in favour of the view that it was a mistake to take it out of the Pharmacopœia, for it is still extensively ordered—indeed in some places it is more used than formerly, although in others it is scarcely used at all. On the whole, the case for reofficialising was made out, especially when we consider that the iodide can be made to keep stable under ordinary conditions. There were a few sceptics, who suggested that when made into pills the iodide rapidly changes, and the interior yellow colour of samples submitted to the meeting by Mr. Martindale was cited in proof of the assertion. This we may take as the second point of the discussion—viz., the change of the salt, and of this we may fairly say that all the evidence adduced went to show that red iodide does not exist in the salt to the extent which has been supposed; moreover, there is nothing very substantial upon which we can base a positive assertion as to the proper colour of mercurous iodide. The third point of the discussion had reference to the dose of the salt, but on this little was said, further than the fact that much less is now given than formerly. It would be impossible to pass to the next subject without reference to the remarkably expressive speech made by the President on what should and what should not be put into the Pharmacopœia. Mr. Unney was all for pure—absolutely pure—substances, and he would exclude substances such as hydrarg. c. cretæ and hydrarg. iod. viride, the use of which, he added, has much diminished during recent years. It is the duty, he submitted, of the Pharmacopœia authorities to provide remedies which are stable. The preparations of mercury above mentioned are not bodies of this kind, and therefore he thought the Pharmacopœia authorities were wise in excluding hydrarg. iod. viride. These views were not allowed to pass without challenge. Mr. Schacht and Dr. Symes especially putting forward the argument that absolute chemical purity is not always necessary in

medicine; and, provided they could ensure consistent constancy, that might be all that therapeutics demanded. Following this we had a paper by Mr. H. Broadbent

Cream of Tartar.

on cream of tartar. The author supplemented the information given in his paper published recently in this journal by results obtained from the examination of Italian and German samples of the tartar, the whole showing that cream of tartar is of remarkable uniformity in quality, 93 per cent. being the average amount of acid tartrate of potash, and between 4 and 5 the percentage of calcium tartrate. He therefore urged that the Pharmacopœia should be a little more specific in regard to these factors, especially in regard to the amount of calcium tartrate, which the United States Pharmacopœia fixes at 6 per cent. In the course of the discussion which followed this communication, it became evident that there is not unanimity of opinion regarding cream of tartar amongst those who have extensive experience in the matter, Mr. Cripps especially maintaining that the bitartrate is not so constant as Mr. Broadbent indicated; but the speakers generally appeared to favour Mr. Broadbent's view of the matter; and there can be no question of the fact that cream of tartar has very much improved of late years, because chemists have insisted on having an article as free as possible from lime and absolutely free from barium. The latter contaminant received some attention in the course of the discussion. Altogether we had here a serviceable communication, which should have the effect of promoting a Pharmacopœial limit for calcium tartrate; and should a direct saturation test be introduced (that apparently being necessary, owing to the fact that the incineration test takes in neutral potassium tartrate as well as the acid tartrate), some provision would have to be made for excluding acid sulphate of potash, which has during recent years become extensively used as a tartar substitute. At this stage of the proceedings the Conference was honoured with a visit from Sir Frederick Abel, President of the British Association, and Professor T. E. Thorpe, as a tribute to whom the President suggested that the paper of highest scientific importance—that of Mr. Hodgkin on synthetic remedies—should be read. Mr. Hodgkin did not attempt to read it. *In extenso* it would occupy more than six pages of this journal—indeed, it was something better than the skeleton of a book on the subject, and that obviously was too much to read *seriatim*. So Mr. Hodgkin gave a graphic statement of the main facts, illustrating it by a blackboard demonstration. In the paper Mr. John Hodgkin dealt with

Synthetic Remedies.

a department of materia medica which is growing over the heads of pharmacists who do not follow every new advance in organic chemistry. Mr. Hodgkin did not, however, confine himself to new remedies—several, such as chloroform and acids of the aromatic series, naturally coming under consideration. After pointing out that the trivial names of synthetic remedies oftener indicate physiological action rather than chemical constitution, he showed that hypnotics and anaesthetics fall under the fatty-acid group, and antipyretics and antiseptics are members of the aromatic series, being benzene, naphthalene, or quinoline derivatives. Then, by means of graphic formulæ, he showed how the bodies are related to each other; in this way dealing with such medicines as chloroform, paraldehyde, sulphonal, and allied bodies of the fatty-acid series, and antifebrin, antipyrin, exalgine, phenacetins, salicylic acid, salols, &c., in the aromatic series. Such a paper as this was not open to discussion—indeed Mr. Hodgkin confessed that he made it so as to avoid that. Sir F. Abel felicitously expressed his high opinion of pharmacists and the work they are doing; then Mr. A. H. Allen amused the meeting with some racy remarks on

the nomenclature of synthetic remedies, concluding with the observation that he would use the trivial names for Pharmacopœia purposes—"antipyrin," for example, rather than "phenylon." Mr. Allen also commented upon the importance of studying the chemical relation of these bodies. Dr. Thresh also commented upon the paper. Following

Oils and Lard.

this, Mr. T. Fairley, of Leeds, read two useful notes on the analysis of oils, and on the estimation of cotton-seed oil in lard. In a town like Leeds, where large quantities of oil are used in wool-cloth manufacture and in tanning, much of the oil is afterwards recovered; but it then contains a certain proportion of unsaponifiable oil, which analysts are called upon to determine. The plan adopted is to saponify with alcoholic potash, dilute with water, drive off the alcohol, and dissolve out unsaponifiable oil with ether. But there is a difficulty here, owing to the slowness with which the ether separates, and this was the point that Mr. Fairley endeavoured to improve, which he does by keeping the volume of water down to 40 or 50 c.c. Mr. A. H. Allen expressed the opinion that this suggestion, or "trick," as he called it, was a valuable one. Regarding the adulteration of lard with cotton-seed oil, Mr. Fairley informed the meeting that the difference between the specific gravity of lard and of cotton-seed oil is large enough to admit of the quantitative determination of the latter by noting the specific gravity. But, as several members pointed out, this observation can be of little value in testing "lard" which is a mixture of lard, cotton-seed oil, and something else whose physical properties are not taken into account. A third note by Mr. Fairley was of rather a

Bile.

curious character, as it dealt with the examination of human bile drawn daily from a lady who suffered from over-production of that element of human economy. Thirty ounces were drawn off daily, and it showed on analysis unmistakable evidence of the presence of copper, while the gall-bladder fluid was found to be decidedly antiseptic in character.

At this stage came the luncheon hour, and on resuming we had Mr. Kirkby's note on an adulteration which he has recently found in saffron. It simply gave particulars of the anatomical appearance of the adulterant, which consisted of narrow flattened fibres of a Turkey-red colour, from $\frac{1}{2}$ to $1\frac{1}{2}$ inch long, having a central vascular bundle and four cortical vascular bundles just within the epidermis. Mr. Kirkby thought that the fibres, which constituted 41 per cent. of the sample, were obtained from a species of carex. When we state that Mr. Gerrard's paper on Henbane deserved the first place in the proceedings, we do not mean to underrate the importance of some other communications which were made, for unquestionably, in point of interest, and as records of prolonged and careful research, the papers by Messrs. Wright and Farr stand out clear as the monuments of the meeting. Mr.

Adulterated Saffron.

Robert Wright's paper on menstrua for tinctures was based on experiments carried on during the past three years, with all the official preparations under this heading except 24, which are either simple solutions or are of such a nature as to preclude such experiment as the investigation involved. In the case of rectified-spirit tinctures Mr. Wright worked with the official menstrua and three weaker menstrua down to and including proof spirit; and in the case of proof-spirit tinctures, two menstrua stronger and one weaker in alcohol were employed. In all cases the amount of dry extractive yielded by the products was determined, as well as the alkaloid where such existed, and the keeping properties were also noted. Obviously, the amount of extractive increased as the alcoholic strength of the menstrua decreased, and, as far as

Menstrua for Tinctures.

the rectified-spirit tinctures are concerned, little is to be learnt from the experiments except in the case of those which contain a separable active principle. From the tabular statement of the results we gather that aconite would be better if treated with S.V.R. 4 vols., water 1 vol., than with rectified spirit alone; and veratrum viride would also be much better treated with proof than with rectified spirit. Amongst proof-spirit tinctures those of belladonna, eonium, and galls also require more spirit. Asafoetida, cinnamon, pellitory, and sumbul require a menstruum slightly weaker in alcohol than the official one, and there are a few proof-spirit tinctures which might equally well be made with equal parts of rectified spirit and water. It is noticeable that Mr. Wright prepared all the tinctures by simple maceration, in defiance of official instructions. This does not affect the principles underlying the investigation, but as the paper placed the official menstrua in comparison with others, it would have been better if the official methods had been used; but, as it happened, Mr. E. H. Farr dealt with alkaloidal tinctures in a very similar way to Mr. Wright. He used spirit of four strengths, making the tinctures in the British Pharmacopœia way, and determined the percentages of extractive and alkaloid miscibility with water and absolute alcohol, and the keeping properties of each one. The results obtained seem fairly near to those given in Mr. Wright's paper, so it may be concluded that the maceration process and the macero-percolation process are equally serviceable in the preparation of tinctures. The hint which Mr. Farr gives in regard to tincture of opium is worth taking advantage of. He finds that a tincture weaker in spirit than the British Pharmacopœia one does not produce the nasty after-effects which laudanum generally causes. This is probably because the weaker-spirit tincture contains less narcotine and no resin. As soon as these papers were read, the Conference at once perceived their importance, and the authors were by no means too profusely thanked for the enormous labour which their communications involved. One speaker put the effect of the results very concisely when he said that they would revolutionise the whole of the Pharmacopœial tinctures. We need not go this length, but the value of the data to the Pharmacopœia authorities is indisputable, and we commend a careful study of the papers to all who take a genuine interest in the advance of pharmacy. It will then be seen that much of the criticism elicited during the discussion is not pertinent. Having for many years urged the necessity of such research as these papers involved, we are pleased to notice that every speaker appreciated the value of it as soon as they had it in black and white before them.

The next papers which were taken were on extract of malt. In the first of these Mr. John C. Unney reported upon the quality of the commercial semi-solid extract, only a few specimens of which can be called first class—two converting their own weight of starch in four minutes. These were the best, and it is fair to say that they were decidedly good, and English. But the author gave preference to a liquid extract, and stated in detail how to make it, this information being the result of experiments on the large scale. What is done is to make first of all a semi-solid extract, and then add spirit to this in such a proportion as to make it a syrupy fluid. This extract does not become thick in cold weather, and digests its own weight of starch in six minutes—a good result, although below the best English extract. The second paper was by Mr. D. B. Dott. In this it was urged that the best way for testing the extract is by estimating the amount of sugar produced by a known weight of the sample acting upon arrowroot mucilage, and he was of opinion that a

Malt Extract.

standard should be agreed upon—viz., that under the conditions stated in his paper the extract should produce not less than three times its weight of sugar from starch. The discussion on these papers was a little surprising. Mr. J. C. Umney did not scruple to “show his hand” in a way, and several other chemists, including Mr. S. M. Burroughs, followed his example. We may take it that the elements of success in this department of manufacture are not altogether attention to fineness of powder and so forth, but perfection in mechanical appliances; nevertheless those who think of beginning the manufacture of malt extract will find useful hints in these papers. Cordially do we approve of all that was said regarding the necessity for a recognised standard and method of assay, and it is a pity that the Conference is not so perfectly organised as to have provision for remitting such questions on resolution to a committee for consideration. The next subject discussed was buchu, on which Mr.

The Three C. J. S. Thomson sent a paper, the gist of which
Buchus was that the *crenulata* leaves yielded 1.6 per cent. of volatile oil, the *betulina* 1.45, and the *serratifolia* less than 1 per cent. All contained much about the same quantity of resin, but the longest leaves had less mucilage in them than the others have, so that, look at it how we may, the long leaves come out the worst, although they are the highest priced; and the meeting seemed to be convinced of that. A short note on the means for preventing

Syr. Ferri syrup of hypophosphite of iron becoming
Hypophos. opalescent was the next subject. Mr. J. Macintyre, the author of the paper, showed that a quarter of a grain of citric acid to the ounce of the syrup prevents the change—or hides it, Mr. A. C. Abraham thinks. The last two papers on the programme were not read. Mr. David Hooper was the writer of one of them.

Manna. In it he communicated facts regarding the natural history and chemistry of a number of Indian and Persian mannas, which bring our knowledge of this curious class of substances to something like completeness. Although the manna used by us contains no body with optical properties, most of the substances described by Mr. Hooper do have an influence upon polarised light, this being due to sugars, the proportions of which he has in all cases estimated. Those who take an interest in Scriptural phenomena will find in Mr. Hooper's paper some statements regarding the way in which showers of manna are produced, which may help to explain how the Desert food of the Children of Israel was formed. The last paper also came from India;

Curry the writer, Dr. Mootooswamy, of Tanjore,
Leaves. describing the properties of the leaves of a resinaceous plant—*Murraya Koenigii*—which grows in Southern India, and is used as a specific for diarrhoea, as well as for other purposes in native medicine. The author is able to confirm the domestic belief in the virtue of the remedy.

This, then, is the work of the Conference. A presidential address, which appeared to charm everybody who heard it, and 28 papers, many of which were of real practical importance, all disposed of in about nine hours is certainly a piece of work to boast of, and it would be inhuman to expect that every one of the 200 pharmacists who attended should sit it all out. They did not: for the attendance fluctuated between 50 and 70 until the last hour, when the applauders, the cricket enthusiasts, and the ladies came in to add density to the shower of thanks which fell upon the local organisers and the popular retiring president. Yes, the Leeds meeting of the Conference has been a success, and the Yorkshire metropolis hands it over to gallant little Wales a healthy and active organisation.

THE PRESIDENT ON PATENT MEDICINES.

A STRONG temptation necessarily presents itself to all popes, priests, and presidents to bulge largely on the attention of the worlds, great or small, which may become temporarily subject to their sway. They enjoy, in common with the rest of the world, that good conceit of themselves which the Scotch clergyman prayed for; and they may justly assume a larger share of that quality if they have been selected from the common crowd to their position of authority. It will be noticed that in presiding over the British Pharmaceutical Conference at Leeds this week, Mr. Umney restrained this inclination, if it possessed him, very successfully. The brevity of his presidential address was an innovation. He delivered it in effective style in just twenty minutes, which is only about half the average period occupied by his predecessors in the discharge of this important function. By this and other economies in the official proceedings more time was available for the consideration of an exceptionally full programme of papers; and in conducting the discussions on these Mr. Umney exhibited, as last year, his peculiar fitness for the position in which he had been placed.

While accepting the “unwritten but wise understanding” that pharmaceutical politics were to be carefully eschewed in the presidential address, Mr. Umney took his audience to a point where a very important topic which might be thus classed could be advantageously surveyed. A discussion of fashions in medicine led naturally enough to some comments on the growing modern appreciation of patent medicines. That these are growing in public favour is evidenced by the fact that the stamp duty, which yielded only 43,000*l.* in 1860, produced nearly 220,000*l.* in the year ending March 31, 1890. This development is “surprising,” as we show elsewhere, to the not very impressionable soul of the Board of Inland Revenue reporter, and it is right that chemists, who have a pretty large hand in the manipulation of this business, though they are not, as a body, responsible for it, should have it brought under their notice from time to time.

The President, we may hope, made a wrong estimate of the nature of the pharmacists around him, when he hinted, as the first consideration on this topic, at “the considerable advantages which would accrue to the medical profession and pharmacy” even if a portion only of the one and a half millions which he calculates is spent for such products were “directed into the channels of legitimate medicine.” Needless to say, the members of the British Pharmaceutical Conference applauded this orthodox sentiment; but we are sorry to have to add that the aspiration they thus endorsed brings them no nearer to the fringe of those one and a half millions than they were before. Nor would the abolition of the medicine stamp, which Mr. Umney ultimately advocates, help much in this direction. Ready-made physic of some kind or other is as much a part or parcel of our modern civilisation as ready-made tarts or buns. We should as soon think of getting all our food prescribed by a cook and prepared by a baker as required, as we should think of going through the hands of the prescriber and dispenser whenever some part of us goes wrong or works inefficiently. Chemists, with a store of drugs and medicines always at hand, can scarcely appreciate the cause of the popularity of so-called patent medicines or ready-made physic. A headache or a toothache or a sore throat attacks the pharmacist as well as the rest of the world. His corn twinges, his baby screams, or his finger gathers. He knows the right remedy or application, and has it always at hand.

The outsider has neither of these advantages, and therefore to him some ready-made physic, suitable for complaints to which he may be liable, is a desideratum. He does not necessarily believe all the advertisements say; he certainly does not attach any importance to the Government stamp. But he knows from experience that these medicines in most cases fairly fulfil their purposes, and he finds it more convenient to treat himself with them than to be prescribed for specially on each occasion. That is why ready-made physic is so popular. It offers to the ordinary mortal the remedy he needs, or something near it, and saves him from the unpleasant task of detailing his symptoms to a doctor or chemist.

That is one side of the case. Probably 90 per cent. of the medicines sold in this way are safe and do good; but there is, it must be admitted, far too free an opportunity for supplying dangerous medicines, and familiarising the public with their effects. This, as Mr. Umney says, "is a subject of deep concern, and a prolific source of both mental and physical degradation." These words, coming from the President of the British Pharmaceutical Conference, will attract serious attention, and should assist in checking the traffic alluded to. Probably nothing more can be done beyond rendering the sale of poisons covered by the medicine stamp subject to the same regulations as if sold *in propria nomine*. That not even this is done is simply the fault of the apathetic gentlemen in whose hands, as Council of the Pharmaceutical Society, lies the initiation of prosecutions. They have been told by several eminent authorities that the medicine stamp does not exempt these preparations from the operation of the Pharmacy Act, for they are poisons; cases suitable for testing this opinion must come before them monthly, and yet they will neither move nor, amid all their loquacity, will they give a reason for not taking action. Mr. Umney's "non-political" but timely observations will perhaps have the effect of reminding them of their duties and responsibilities.

We have confined our remarks to this one section of the President's address, because it is the only part which offers an opening to criticism, and also because it points the way to some definite result. The other topics broached were treated shrewdly and concisely, and the address, as a whole, deserved undoubtedly the applause which it evoked.

INLAND REVENUE RETURNS.

THE Commissioners of the Inland Revenue have just issued their report for the financial year which ended on March 31 last, in the course of which they received the sum of 52,982,829*l.*, or 1,176,585*l.* more than in the preceding year. Had it not been for the transfer of the English and Welsh licence duties to local authorities under the Act which came into force during the year 1889, the increase in revenue would have been over 4,000,000*l.* Spirits yielded 13,860,002*l.*, and the Excise statistics show that, whereas the increase of alcohol consumed as a beverage in 1889 compared with 1888 was 6.38 per cent. in England, it amounted to 8.57 per cent. in Scotland, and to no less than 11.52 per cent. in Ireland. The consumption per head of the population in England was 0.580 gallon, and in Ireland 0.998, while the average Scot imbibed 1.536 gallon during the year. On March 31, 85,376,937 proof gallons of British spirits were held in stock in bond—a quantity more than sufficient to meet the probable consumption for the next three years.

The employment in 1889 of methylated spirits in the arts and manufactures shows a large increase over the preceding year, the quantity of spirits entered into the warehouses for methylation having been 3,188,306 against 2,950,904 gallons.

No fewer than 1,819 cases of illicit distillation were reported during the year, nearly the whole of which took place in Ireland.

The consumption of tea per head of the population was smaller than in 1888, the figures being respectively 4.908 lbs. and 4.950 lbs. Coffee also declined from 0.815 to 0.749, but the use of cocoa has slightly increased, the average being 0.488 lb. in 1889, against 0.486 lb. the year before. The duty on British-grown tobacco was 86*l.* in 1889, against 91*l.* in 1888—a result which is the reverse of encouraging with regard to the spread of the industry, especially if considered in conjunction with the fact that the duty levied on imported tobacco realised 1,077,883*l.*

The patent-medicine stamp duty again shows an increase of about 8 per cent. It yielded 217,264*l.* in 1889-90, against 202,375*l.* in 1888-89, and the Commissioners, whose admirably detailed report affords valuable information with regard to the origin of the fluctuations in almost every other instance where receipts rose or fell, content themselves, in this case, with expressing "surprise" at the rate of increase.

The total number of licences and certificates issued by the Inland Revenue during the year was 21,004, and the amount received for these documents attained the figure of 160,375*l.* Nearly the whole of this, it is satisfactory to note, was contributed by solicitors for their certificates, and by bankers for licences, only 3,507*l.* being taken out of the pockets of the alkali trade for the issue of 1,081 certificates of registration of alkali and other works.

Among the licences issued by the Excise 22,903 were patent-medicine (vendors') licences at 5*s.* each, the total revenue derived from this source being 5,726*l.* Of these licences 21,229 were issued in England and Wales and 1,674 in Scotland. Twenty licences for the manufacture, and 9,754 for the retailing, of methylated spirits brought in 5,241*l.*, and 908 licences were issued for the use of stills by chemists. The principal of the Laboratory Department reports that 47,180 samples were analysed in 1889. This shows an increase of 2,184 samples compared with the preceding year, attributed partly to the fact that this has been the first entire financial year in which the new regulations affecting the drawback on medicinal preparations have been applied. Unfortunately the report does not give a detailed account of the value and quantity of the medicinal preparations exported under the new regulations. Such an account would have been of great value, in showing the precise extent to which our national commerce has been the gainer by the drawback regulations, and it is to be hoped that authoritative figures on this subject may soon be forthcoming. We find it stated, however, that 1,759 samples of "tinctures" were taken for examination in the year ending March 31, 1890, against 662 in the preceding year. As the entry "tinctures" does not occur in previous years, we may presume that it represents the whole of the goods exported under the tincture-drawback regulations. We believe that the experience of the exporters is that the authorities generally take half-a-dozen samples out of each shipment, and we may, therefore, fairly conclude that the number of shipments during the year has been about 300. The number of samples referred to the Laboratory by magistrates in disputed cases under the Sale of Food and Drugs Act only amounted to 26, or about half the average number of previous years. The samples comprised milk, buttermilk, butter, pepper, mustard, whisky, and spirit of nitrous ether. In 18 cases the Laboratory confirmed the certificates of the local analyst.

Nineteen of the samples referred to the Laboratory consisted of milk, and of these 15 were alleged to contain added water, and 4 to have had cream abstracted. In 12

of the former the Laboratory agreed with the local analysts, and reported added water varying from 5 to 42 per cent., but in 3 of the latter it could not sustain the charge for abstraction of cream. One half of the 20 vinegar samples analysed for the Admiralty were found unfit for the required purpose, and of 531 samples of lemon and lime juice, representing 68,003 gallons, 25 samples, representing 3,298 gallons, were rejected for the same reason.

General News.

THE WEDNESBURY SUPPLY STORES, LIMITED, with a capital of 1,000*l.*, in 1*l.* shares, has been formed to carry on, in any part of the United Kingdom, the businesses of wholesale and retail chemists and druggists, grocers, drysalterers, &c.

DR. JAMES MATTHEWS DUNCAN, the eminent physician who died suddenly from heart disease at Baden Baden on Monday, was Sir James Simpson's private assistant while that investigator was pursuing his experimental researches into the properties of various anaesthetics, and Dr. Duncan is said to have been the first person who was rendered insensible by chloroform.

CARBOLIC-ACID POISONING.—Miss Jessie Geller, aged 26, daughter of Mr. S. R. Geller, described as an evangelist, of Matching Tye, Ipswich, died last week from the effects of carbolic acid. From the evidence adduced at the inquest it appeared probable the deceased had inadvertently drunk a quantity of a carbolic mouth-wash which she had in her bedroom. The jury brought in a verdict to that effect.

DEATH IN CHEMICAL WORKS.—James Bright, chemical labourer, aged 53, with his son, 15 years of age, were engaged in emptying a boiler at the Widnes Alkali Works, and at about 12 o'clock the lad left to go to dinner, his father saying that he would shortly follow him. As he did not appear search was made for him. His dead body was found lying face downwards in the boiler, he having been overcome by some noxious gas which had accidentally entered the boiler.

BURGLARS USE CHLOROFORM.—A curious case is reported in the American papers as having occurred at Baltimore on August 8. Mrs. Cookley and three daughters and a man in the house named Stone all woke early in the morning feeling very sick, and there were grounds for believing that they had all been chloroformed. Stone had also been struck on the head. It was found that during the night burglars had ransacked the house, had leisurely taken supper, and had carried off a large quantity of valuables. No trace of them had been discovered.

NEW WINE LICENCES have been granted under 23 Vict. c. 27, s. 3, to Mr. J. B. Francis, chemist, Shrewsbury; to Mr. T. C. Lamb, chemist, Chatham; to Mr. W. S. Harvey, chemist Margate; and to Mr. Herbert Ray, chemist, Margate. The *Times*, the *Pall Mall Gazette*, and other papers have reported these Margate licences as a new and tremendous portent. Says the *Pall Mall Gazette*:—"With the chemist as well as the grocer thrown in to swell the ranks of the wine merchant, and the medical faculty increasing rather than diminishing its ancient vice of prescribing alcohol, where are the watch dogs of temperance to turn?"

THE INSTITUTE OF CHEMISTRY.—At last Tuesday's meeting of St. Luke's Vestry (Major-General Moberly, churchwarden, presiding) the clerk read a letter from Mr. Chas. E. Groves, registrar of the Institute of Chemistry, saying he was instructed by the president of the Institute to call the attention of the Vestry to the official list of members of the Institute, which was originated for the better education and examination of public and technical analysts and medical officers; also of all professional chemists of standing. The chairman thought it would be a useful addition to the Vestry's library, and a resolution was adopted to place it therein.

HOLIDAYS.—The employes of Messrs. Idris & Co., mineral-water manufacturers, of Kentish Town, had their annual

outing on Saturday, August 23. The place selected for the excursion was Dovercourt, which was reached about 11.30 A.M. The weather turned out everything that could be desired, and a most enjoyable day was spent by the sea. About 120 sat down to luncheon which was provided by the firm at Rigg's Retreat, after which the party dispersed, some taking trips down the river to Ipswich, and others going to places of interest in the neighbourhood. Tea was also given by the firm, and the whole proceedings passed off in a satisfactory manner.—The employes of Mr. J. W. Mather's chemical works, Dyer Street, Hulme, held a picnic on Saturday, August 30. They went to Alderley Edge, Cheshire, by special 'buses, provided by Mr. Mather, and the party spent a thoroughly enjoyable day, the weather being delightful.

SALE OF VERMIN-KILLER.—At an inquest held last week at Kimberley on Mary Severn, a domestic servant, aged 21, who had poisoned herself with vermin-killer, the following evidence as to the sale of the poison was submitted. Frederick Blomfield, assistant to Mr. Merry, chemist, of the Market Place, Ilkeston, said the deceased came to their shop between one and three o'clock in the afternoon of August 18. He knew her by sight, but could not recollect where he had previously met her. She asked for a packet of vermin-killer to kill mice. On being questioned she said she was 21, and described herself as "Mary Severn, of Watnall." Witness supplied her with the powder, for which she signed her name in a "Poison Register." What the deceased was supplied with contained 2 grains of strychnine in about a drachm of powder. She paid 3*d.* for it. It was usual to have a witness to the purchase of poisons; but this was not done in the case in question, for, although the deceased said "No," when asked if she had a witness, she was served with the powder. The packet was labelled "Poison"; besides which, witness cautioned deceased as to its nature, and gave her directions regarding its use. There was nothing about the deceased's manner to excite the slightest suspicion, or witness would have refused to serve her.

A SEQUAH TROPHY.—At the Oxford City Court, last week, Henry Wardle, of "Sequah" (Limited), lodging at 19 New Inn Hall Street, was summoned for assaulting a boy named Edward Charles Simmonds, of 3 Abbey Place, St. Ebbe's, by drawing one of his teeth in the Circus Grounds, Church Street, St. Ebbe's, on Saturday, August 16. Mr. H. F. Galpin appeared for the defence, and pleaded not guilty. The boy being too young to be sworn, his father described how his boy came home with a bleeding mouth. Another boy described how Simmonds, with five or six other boys, mounted Sequah's van at defendant's invitation, and Simmonds had a tooth drawn. It was a double tooth, not decayed, but discoloured. Mr. Galpin admitted the facts alleged by the prosecution, but argued that no assault had been committed. Quoting Stone, he said: "An assault is an attempt by force or violence to do bodily injury to another; it is an act of aggression done against or upon the person of another without his consent." An assault to constitute a crime, therefore, must contain two elements. There must be hostility on the part of the aggressor, there must be non-consent on the part of the complainant, and if either of these elements was wanting—if, for instance, he touched a man in a crowd simply with the idea of asking him to move away in order that he might get by, that was no assault—there was no hostility on the part of the aggressor. If, on the other hand, there was consent on the part of the complainant, there was certainly no assault. In this case both elements were wanting. There certainly was consent on the part of the boy, because they had heard he walked up himself in order that he might have a tooth drawn. There was no hostility on the part of the defendant, because he simply stood there to carry out a promise that he made to the persons assembled to draw their teeth. After a short consultation the magistrates decided to dismiss the summons, because they considered the boy, although so young, was a consenting party. They also wanted to express their opinion that defendant should exercise more care and discretion in drawing the teeth of so young a boy as the complainant, who was little more than a baby. Defendant, who said he was much obliged to their worships, left the court, and was cheered by the crowd assembled in the Town Hall yard.



IN the twenty-seven years of its history the British Pharmaceutical Conference has paid three visits to Yorkshire in company with its big brother, the British Association. Bradford was the scene of operations in 1873, Sheffield in 1879, and York in 1881, but until this week the great county's greatest town had been left unexplored. The British Association went to Leeds in 1858, several years before the Conference came into existence. The central position of the town, its mighty industries, and its attractive surroundings were sufficient to ensure the success of the meeting this year; but most of the visitors regretted they

almost too much. But, small or great, he receives a hearty welcome on reaching Leeds, the Midland station of which he finds pleasantly redolent with "sanitas." He finds a comfortable home and a number of trade acquaintances at the Queen's or the Great Northern Hotel, and settles down to make himself familiar with his surroundings.

Leeds claims a very ancient origin. Somewhere near its site, if not on the exact spot, was a place called *Caer-Loidis-Coit*, which meant the town in the wood. This was what it was called when it passed from Celtic to Roman rule. The Romans do not seem to have troubled about the name,

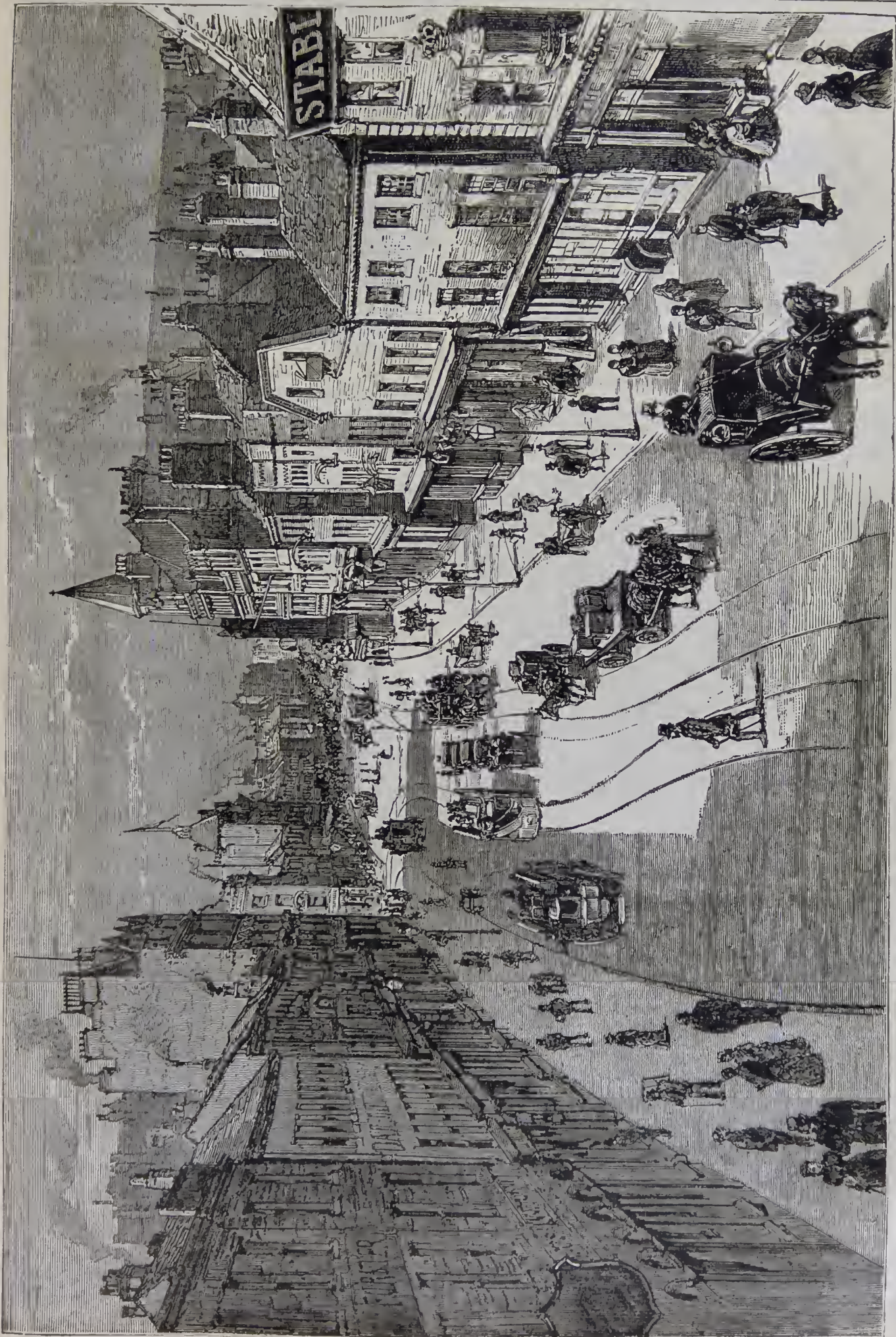


TOWN HALL, LEEDS.

had not more time to make themselves better acquainted with a locality so famous and so interesting.

The pharmacist who travels from London to Leeds, skirting those dreary mining districts which contribute so vastly to the wealth of England, and soon afterwards enveloped in the ocean of black smoke belched forth with angry flames from the reluctant forges of Sheffield, can hardly help feeling disposed to modesty. His own transactions are of such small proportion, when compared with the gigantic battling with earth and fire which the operations glanced at represent, that he is perhaps inclined to underrate himself

though they settled in fair numbers in the district. They worked the ironstone of the locality, and their high road from Calcaria, or Tadcaster, to Mancunium, or Manchester, ran through Briggate. The Saxons left very obvious marks of their residence on the spot, in the old names Briggate and Swinegate, Boar Lane and Kirkgate, which still greet us. The Conqueror handed over the place to Ilbert de Lacy, and it is supposed that Ilbert built a castle somewhere by, but no one knows where that castle stood. The last time it was heard of in history was when Richard II. was residing there involuntarily, previous to his murder at Pontefract, or



BRIGGATE, LEEDS.

Pomfret, which in those days, and for some centuries after, was the metropolis of the West Riding. In 1379 Pomfret had 306 families and married persons; Leeds had 50. In

monarch who spent a night in the town. He too, like Richard II., was a prisoner, and was lodged in the "Red Hall" in Crosby Court, then the most stylish house in the



A BIT IN BRIGGATE.

Pomfret there were fifteen merchants "of high degree"; in Leeds there was but one. But almost as far as its history goes back there were traces of the cloth-making which has



LEEDS BRIDGE.

town. Lord Fairfax, himself of a Leeds family, visited the town soon after in violent fashion, but they had no other representatives of royalty till Queen Victoria opened the Town Hall in 1858.



MUNICIPAL BUILDINGS, LEEDS.

always been its leading staple. In 1275 Alexander Fuller of Leeds is reported to have "made cloth not of the right breadth." In 1630, it appears from a petition for incorporation, the cloth trade of Leeds amounted to 200,000*l.* a year. Charles I. gave the town a charter, and was the second

But Leeds has gone on developing the wealth around it and the industries within its borough limits without the aid of royal patronage. Cloth is still its principal product, but it by no means depends on that manufacture exclusively. It is a great place for tanneries, and its leather market is famous

throughout the world. Its forges compete with those of Sheffield, and its Yorkshire Relish has brought a dainty flavour into millions of homes where the more aristocratic Worcester had never found entrance. In latter years ready-made clothing has been produced in Leeds to an enormous extent.

Leeds is dingy and smoky, but it is spacious. The borough is thirty-two miles in circumference, and covers 22,000 acres. The population, which was 53,612 when the first census was



MECHANICS' INSTITUTE.

taken in 1801, had grown to 309,126 in 1881, and will be nearly 370,000 when the count is taken next year. It possesses some of the handsomest buildings in the country, but it wants its Haussmann to bring the connecting links of the streets into harmony with its occasional grandeur. It has lovely suburbs, some few of which are mentioned and sketched in our report of the recent Conference and the excursion with which the proceedings were wound up.

Trade Notes.

A NEW DISINFECTANT.—The St. Bede Chemical Co. (Limited) are now manufacturing a new disinfectant at their chemical works at East Jarrow. Messrs. Brady and Martin, Newcastle, have been appointed agents for the sale in the North of England.

REMOVAL OF A CHEMICAL FACTORY.—A well-known chemical works on Tyneside, The Tyne Alkali Co., South Shields, will shortly be removed. The Weldon bleaching-powder plant and the chlorate of potash plant will be sold by auction next week, and the land utilised for other purposes than the manufacture of chemicals.

CLARKE'S FAIRY LAMP.—There is a special illumination of the beautiful and varied stock of Clarke's fairy lamps at the London show-rooms, 31 Ely Place, Holborn, every Tuesday and Friday, which well deserves to rank among "the sights of London." A new price-list and coloured lithographs of the latest designs have just been issued by the Clarke Company, Cricklewood, London, N.W.

PAPER-WEIGHT.—We have been presented with a new paper-weight, with drawers for pins, pens, wax, &c., receptacles for cards and stamps; leather covered, brass knobbed, and gilt lettered; occasional remarks about lanoline soap, Kepler malt extract, saccharin tablets, and other luxuries; presented in recognition of our virtues by Messrs. Burroughs, Wellcome & Co.

SHOP HOURS.

We have received the following information:—

	Half-holiday	Satur- days	Other days
		P.M.	P.M.
Barnsley	Thursdays .. from 1	—	—
Congleton	Wednesdays .. " 1	10	8 30
Epsom	Thursdays .. " 5	10 30	9
Spalding	Thursdays .. " 2	—	8
Workshop	Thursdays .. " 1	—	—

Gazette.

PARTNERSHIPS DISSOLVED.

Greeff, R. W., Greeff, H., and Greeff, A., under the style of R. W. Greeff & Co., Mining Lanc, E.C.

Savege & Reid, Swanscombe, general medical practitioners.

Ward & Cliffe, Werneth, Oldham, mineral water manufacturers.

THE BANKRUPTCY ACT, 1883.

Receiving Orders, Public Examinations, Adjudications, Dividends, &c.

Meadows, James Carswell, Walton and Liverpool, aerated water manufacturer.—R.O.—Adj.

ORDER MADE ON APPLICATION FOR DISCHARGE.

Druff, Lionel, trading as Henry Laurence and as the Society of London Opticians, Hatton Garden, and Doughty Street, and Colonial Buildings, Hatton Garden, wholesale and manufacturing optician.—Discharge suspended for twelve months.

A CORDIAL CASE.—Mr. J. E. Hill, deputy-coroner, held an adjourned inquest on Monday, at Shipley, touching the death of two infant girls (twins), who were found dead in bed on the morning of August 10, and at the inquiry, two days later, Dr. Rutherford gave it as his opinion that death had resulted from an opiate. The inquiry had been adjourned until Monday in order to obtain an analysis of a "children's cordial" which the infants had been given. Mr. Allen, county analyst of Sheffield, gave evidence that he had found opium to be one of the ingredients of the cordial. In all probability this ingredient would exist in the cordial in the form of tincture of opium or laudanum. There would really be about one drop of laudanum to a teaspoonful of the mixture. Very young children were very susceptible to the influence of opium, and were sometimes affected by extremely small quantities. There were cases—not a few—on record where a drop of opium had proved fatal, though no doubt larger quantities were often taken without such a result. He would not say that ordinarily that was a poisonous dose. To give a child a spoonful of the mixture might prove fatal. The jury returned a verdict that the children came to their death by "Misadventure, through an overdose of poison."

THE CHEMICAL WORKERS.—A meeting of the St. Helen's Chemical and Copper Workers Union was held on Tuesday night at the Town-hall, to hear an address from Mr. John Burns. Mr. P. J. King, president of the union, said that their organisation, formed in St. Helen's twelve months ago, had improved the condition of the chemical worker; it had improved the lot of the chemical slave, by getting an advance in wages, and by getting a reduction, to some small extent, it might be, in the hours of labour. The men who were out on strike were not going to return until they got their demands. Mr. John Burns said the men would be traitors to themselves, to their wives and children, if they neglected joining an organisation which had for its object the reduction of their hours, an increase in their wages, to give the people of the district a higher standard of comfort, better house accommodation, better food, and better clothing. He was told that the chemical workers had an advance equal to 5s. a week, but had to work as many as 112 hours a week. These men were worse than beasts, for no man would work his horse or his donkey so long. Eight hours a day and six days per week were quite sufficient for any chemical worker. He had been to Liverpool that day. Liverpool was a frightful city. Instead of accepting the invitation of the Mayor, he went down Fairclough Street and Christian Street, where poverty and misery and dirt festered, and insanitary conditions existed as they existed in no other town or city in the world. Every other woman he met bore on her features the impression of brutal treatment from her husband or neighbours. Six out of every ten men were either drunk or under the influence of liquor. It was impossible to expect men to be philosophers or angels or to be kind or sympathetic to those around them whilst they were compelled to herd together like pigs and fight at the dock gates for work, and live the lives of degraded brutes, instead of honest, moral, dignified manhood.

Trade Report.

Notice to Retail Buyers:—It should be remembered that the quotations in this section are invariably the lowest net cash prices actually paid for large quantities in bulk. In many cases allowances have to be added before ordinary prices can be ascertained. Frequently goods must be picked and sorted to suit the demands of the retail trade, causing much labour and the accumulation of rejections, not all of which are suitable, even for manufacturing purposes.

It should also be recollected that for many articles the range of quality is very wide.

42 CANNON STREET, E.C., September 4.

THE week now under review has been a very good one so far as the drug and chemical trades are concerned, and a glance at the price alterations enumerated below will show that a great many articles, including some of prime importance, are moving upwards with more or less rapidity, while only in a few instances have prices given way. The business transacted is mainly speculative; but there is every indication that we are just entering upon a period of considerable activity and animation, and an excellent autumn trade is generally looked forward to. The drug sales held to-day were not very extensive, but they offered a good selection of a few important drugs, and on the whole passed off very firmly. But the improvement is noticeably in heavy chemicals and dry-salteries, even more strongly than in drugs, and it affects, in the first place, those articles which we draw from countries, such as China and India, which are influenced by the strong rise in the price of silver. The following is a summary of the principal fluctuations for the week: In drugs the following are higher: condurango, calumba, cocculus indicus, senega, cuttlefish, Cape aloes, Japan wax, Tinnevelly senna, fine myrrh, galangal, Siam benzoin, honey (in Liverpool), jalap, kola nuts, ipecacuanha, orris root, gum ammoniacum and lycopodium. Camphor and Tonquin musk are steady, excepting one or two parcels of musk which sold slightly lower to day. The following are lower: chamomiles, cubebs, cowhage, cascarrilla, cardamoms, and spermaceti. Among fine chemicals cocaine is firmer, mercurials and iodides steady, and quinine lower. In oils, dry-salteries and metals the following are dearer: Shellac, Carnauba wax, indigo, cochineal, quicksilver, silver, antimony, Turkey galls, cocoa butter, benzol, quillaia, bleaching-powder, chlorate of potash, caustic soda, soda ash, bicarbonate crystal, linseed oil, palm oil, coconut oil, and pimento. Gambier is steady, and the following articles are easier: China galls, Irish moss, sulphate of ammonia, turpentine, petroleum, white pepper, cloves, and nutmegs.

ACIDS.—Carbolic acid still remains very low in price, the current quotations 34–35° crystals, in bulk, 9d. per lb. Citric acid steady at 1s. 3½d. to 1s. 4d. per lb. Oxalic without change at 3½d. to 3¾d. per lb. The demand for Tannic and Gallic acids remains very good, especially for the former, which is quoted at 1s. 1d. to 1s. 4d. per lb., according to quality. Tartaric acid firm at 1s. 2½d. to 1s. 3d. per lb., according to quality.

ALOES.—The offerings at to-day's auctions were very moderate. Of Cape aloes there were 78 packages (partly re-imported from New York), and these were mostly sold at slightly dearer rates: Good hard, 24s.; fair seconds, partly drossy, 22s. to 22s. 6d.; very drossy, dull and soft, 18s. 6d. down to 15s. per cwt. An arrival of 30 cases has been declared from Algoa Bay this week. Of Curaçao aloes, 225 packages were offered, and 195 sold with difficulty; good bright capey, in hold gourds, 22s. to 25s.; ordinary dull and overheated, 15s. to 18s., very low down to 5s. per cwt. Of East Indian aloes, hardly anything was offered, and practically nothing sold.

ANISE.—At to-day's auctions fair quality Russian anise sold for 18s. per cwt.; for Malta, 25s. was asked; and 28s. for fair bold Italian of good flavour.

ANNATTO.—Some good colony Ceylon seeds sold at 3d., and another parcel was bought in at 4d. per lb.

ANTIMONY has advanced in price, Japan being now held for 52s., Star regulus 72s. to 75s. per cwt., according to brand.

ARSENIC.—Best white powder remains steady at 14s. 9d. perhaps 14s. 6d. per cwt.

BALSAMS.—For a small lot of Peru balsam offered at to-day's auctions 5s. 3d. per lb. is asked. Of Copaiba a few lots which have been previously offered were again included in the auctions. Part was stated to have been sold privately. For thick cloudy Maranham balsam 2s. 5d. per lb. is required, and one cask of clear red stuff sold "without reserve" at 2s. 1d. per lb. For bright Maranham 2s. 4½d. per lb. was lately paid in Liverpool.

BENZOL.—Firm and scarce—90-per-cent. 4s. 3d. to 4s. 4d., 50-per-cent 3s. 3d. to 3s. 4d.

BUCHU.—The scarcity of this drug continues, and as no fresh supplies arrive from South Africa, holders show themselves firmer and firmer. For two hales good round greenish leaves 5½d. per lb. was refused to-day. The owner wants 6½d. per lb. A short time ago 5d. per lb. was accepted for a few bales in Liverpool.

CALABAR BEANS.—The price in Liverpool is maintained at 5½d. to 5¾d. per lb.; but small arrivals are constantly coming forward.

CALUMBA.—A strong speculative demand has arisen for this article; and it is reported that prior to the auctions 28s. per cwt. had been paid for good usual quality. The advance, however, brought out several parcels at to-day's sale, and, so far as we can judge, the article seems to be by no means scarce in the second hand. The demand shown to-day was certainly disappointing—only one bag of fair small mixed root selling at 16s. 6d. per cwt. For good yellow mixed, partly slightly wormy sorts, from 18s. to 19s. was refused; and a parcel of 140 bags fair bright sorts is held for 23s. per cwt.

CAMPHOR (CRUDE).—The market is unchanged, and, in spite of rumours to the contrary, can only be called flat. At the auction 30 tubs Japan camphor were offered; for one lot up to 147s. 6d. was offered, while for another the bidding apparently reached 150s., but both offers were rejected. It is said that there have been retail sales at 157s. 6d. per cwt. during the week.

CANTHARIDES.—A case of Russian flies was bought in at 4s. 6d. per lb. in auction to-day. The c.i.f. price in the market is 4s. 1d. per lb. Several lots of good Chinese flies were shown, and 3 of these sold at 11d. per lb., another parcel being limited at 1s. 3d. per lb.

CARDAMOMS.—About 212 packages, a scratch assortment, consisting largely of second-hand and so-called "London bleached" cardamoms, came up for sale to-day. Many lots were held at exaggerated limits, but the demand was very slack indeed, and about 40 packages sold at an irregular decline of 2d. to 4d. per lb. There was quite an exceptional demand for Seeds, however, and two lots sold at 1s. 8d. to 1s. 11d. per lb. respectively—say about 2d. to 5d. dearer. A parcel of rather ordinary brownish round Mangalore was bought in at 2s. 3d. per lb.; another lot at 3s. per lb. Ceylon-Mysore: Fine medium to hold full white are held for 2s. 10d. per lb.; fine bold bright London bleached Mysore were bought in at 3s. 4d. per lb.; fair medium to bold yellow sold at 2s. to 2s. 1d., long pale at 1s. 7d. to 1s. 8d.; long and round mixed dull grey at 1s. 6d.; small to medium round brown, 1s. 4d. to 1s. 8d. per lb. Malabar: Good pale grey bold round sold at 2s. 6d. per lb. Good bold Wild Ceylon brought 1s. 8d. per lb.; very small and lean Tellicherry, 1½d. to 4d. per lb.

CASCARRILLA.—At to-day's auctions two parcels, together 86 bales, were offered and sold at lower prices compared with those last obtained in public sale. Good silvery quill, rather small mixed, brought 32s. to 33s.; smaller and greyer ditto, 30s.; and dull shavings, 25s. per cwt. At Liverpool a parcel of 50 hales was recently sold at 26s. per cwt.

CHAMOMILES.—The new crop is still being gathered in Belgium, and the yield is generally stated to be a very large one. Prices for best quality flowers range from 40s. to 42s. 6d. per cwt., and for fine French up to 50s. per cwt., but the market is dull.

CINCHONA.—The supply of South American barks at to-day's auctions was of the most meagre description, and nothing was sold which calls for remark, except 12 bales Carthagena (hold flat red pieces, partly quilly) at 7d. per lb.

for sound, and 5½d. per lb. for damaged. Much interest attaches to the cinchona auctions which will be held here on Tuesday next. Up to the present time only 930 packages *Ceylon* and *East Indian* and 395 packages *Calisaya* bark have been declared, but in all probability these figures will be materially altered before the 9th inst.

CIVET.—The price for fair quality is 7s. 3d. per oz.—an offer of 7s. per oz. made at the auctions was refused.

COCA LEAVES.—Prices are well maintained, and there is a steady demand for good green leaves. At to-day's drug-sales 44 bales South American leaves, all badly sea-damaged (salvage), but otherwise strong, sold, without reserve, at ¾d. to ¾d. per lb.

COCAINE has been in better demand, and some brands are quoted a little dearer. The price runs from 14s. to 15s. 6d. per oz. from the makers.

COCULUS INDICUS is dearer. Only 1 bag was offered to-day, and sold for 11s. 6d. per cwt., while privately 11s. 3d. per cwt. has been paid for one or two parcels.

COCOA BUTTER.—At the usual monthly auction held on Tuesday, 350 2-cwt. cases of *Cadbury's* brand (A) were offered. The whole sold, with good competition, at an advance of 1½d. to 1½d. per lb. over the previous auction's prices—viz. 1s. 3½d. to 1s. 3½d. per lb. On the same day 50 tons of *Van Houten's* cocoa butter were sold by auction at Amsterdam, at 1s. 2½d. per lb.

COLOCYNTH.—Steadily held at 1s. 3d. per lb. for fair pale partly seedy Turkey apple. Eleven cases shown at auction to-day might be had for that price.

CONDURANGO.—Much dearer in consequence of Continental speculation. Ten bags sold to-day at an advance of fully 1½d. per lb.; 5d. to 5½d. being paid for woody and dull bark.

COWHAGE.—There is still a considerable over-supply of this article, which is one of very limited consumption. At to-day's auctions one tin sold cheaply at 2d. per oz., and 5 cases were bought in at 2½d. per oz.

CREAM OF TARTAR.—Steady at 100s. to 101s. per cwt. for best white *French* crystals on the spot.

CROTON SEED.—A small lot of fair bright seeds sold to-day at 14s. per cwt., subject to owners' approval.

CUBEBS.—The arrivals of this drug are heavy, and quotations continue to give way slowly but unmistakably. Of one parcel of 20 bags shown to-day 3 sold at 21l. per cwt. for fair shrivelled berries. Of another parcel of 36 bags, imported *via* Amsterdam, 1 lot of very stalky and dusty berries was also sold at 18l. per cwt.

CUMIN SEED.—In Liverpool the price of fair *Malta* seed rules at 20s., but at to-day's London auctions an offer of 22s. was refused for 56 bales, which are held for 22s. 6d. per cwt.

CUTTLEFISH.—The demand is good, and prices are just a shade higher. At the auctions 22 cases good pale bone, small to bold, from Bombay, sold at 3d. to 3½d. per lb., and small pieces at 2½d. per lb.

DRAGON'S-BLOOD.—Only 4 packages good soft fiery lump were shown to-day. The price for this parcel is 10l. 15s.

ERGOT OF RYE.—Slightly wormy *Spanish* ergot is held for 1s. 2d. per lb., and very ordinary sifted wormy at 1s. per lb. *Russian* ergot is offering at 1s. per lb., c.i.f. London.

GALANGAL.—Still advancing; 17s. per cwt. has been paid a few days ago, and 18s. to 19s. is now required.

GALLS.—China galls are very quiet at nominal quotations. It is said that a fair business has been done in *Turkey* galls, blues having been sold up to 49s. per cwt., at which there are no further sellers. Whites are also scarce, with business at 45s. per cwt. At the drysaltory auctions on Tuesday, 585 cases unworked *China* galls sold without reserve at low prices; plum-shaped and broken to good pale at 59s. 6d. to 62s. per cwt.

GAMBOGE.—Of 26 packages offered to-day only 4 sold at unaltered prices; 9l. 12s. 6d. to 9l. 15s. for fair cakcy and ricey pickings slightly damp. The price for some dull small broken, partly ricey pipe, is 10l. per cwt. The assortment did not contain any gamboge of fine quality.

GENTIAN ROOT.—Only 19 bales sold to-day, thin and rather dull root from Bordeaux at 15s. 6d. per cwt.

GLYCERINE.—Prices are tending lower, and good brands of double distilled, s.g. 1.260, are quoted by makers at from 61s. to 65s. per cwt.

GUINEA GRAINS.—The demand in Liverpool continues, and yesterday 20 bags sold at auction there at 40s. to 40s. 6d. per cwt. Some time ago, however, up to 50s. per cwt. was paid.

GUM AMMONIACUM.—Two cases small seedy grain and yellow drop and siftings, partly blocky, realised the exceptionally high price of 42s. per cwt., while one case ordinary dull seedy lump brought 12s. per cwt.

GUM ARABIC.—There is very little animation in the market, and we do not hear of any important transactions in East Indian gums. Some fine white *Mogadore* gum was shown to-day and bought in at 14l. per cwt., and several parcels *Cape* gum sold at high prices; fine soft small and dusty white, 9l.; pale dusty sorts mixed with a few ambery pieces, 68s. to 71s. 6d.; per cwt. good pale siftings 57s. to 66s. per cwt.

GUM ASAFOETIDA.—An arrival of 150 cases was offered for sale to-day; but very little attention was given to it, and only six cases sold at 25s. per cwt. for heavy partly pinky and partly grey, mixed with stones. Nearly the whole of the asafetida now offering is much adulterated with stones and earthy matter.

GUM BENZOIN.—A large supply of *Siam* benzoin was shown to-day, and met with a good demand, higher prices being realised for most of the 17 cases sold. Two cases very fine bold pale loose almonds brought 25l. 5s. per cwt., a trifle over the price last paid. For 10 cases fine small to bold almondy seconds, good bright block, an offer of 16l. was refused, the price being 18l. Eight cases seconds sold at 14l. 10s. to 14l. 15s. for good bright small to medium blocky almonds; and seven cases thirds, dull grey brown earthy mixed block, realised the high prices of 6l. 10s. to 6l. 17s. 6d. per cwt. Of *Sumatra* gum 19 cases sold at steady prices; good fair flavoured seconds, pale almonds, rather false-packed sides, 7l. 15s. per cwt. Another lot, rather preferable, is held for 8l. per cwt. *Penang* benzoin, glassy and gummy thirds, was bought in at 70s. per cwt., and several lots of very fine bright orange *Palembang* were shown, and bought in at 70s. per cwt. nominally, with the exception of one case of good quality, which sold at 55s. per cwt. Thirty blocks of spurious benzoin from Bombay, earth mixed with talc, upon which we have previously commented, were again shown and bought in.

GUM GUAIACUM.—Fifteen cases were all bought in to-day; good loose drop slightly woody at 1s. 11d. to 2s. 1d. per lb.; dull and blocky ditto at 1s. 7d. per lb.

GUM MYRRH.—Several parcels were offered to-day. For sorts the demand is slack, and prices are still tending lower. In one instance 72s. 6d. was refused for good palish sorts, while 75s. per cwt. was paid for another lot; some very dark red Zanzibar sorts brought 59s. to 60s.; fair small siftings sold at 57s. to 65s.; red dust at 36s., and pickings at 31s. 6d. to 36s. 6d. per cwt. A few lots of exceptionally fine bold pale picked myrrh from Aden realised high prices, from 7l. 5s. to 7l. 10s. per cwt.

HONEY.—Only a few barrels fair liquid brown *Jamaica* were offered to-day, and sold for 34s. per cwt. From Liverpool an improved demand is reported, both for the home trade and for export. *Californian* has changed hands up to 42s. per cwt.; and Chilian, according to quality, at 25s. 6d. to 35s. per cwt.

INDIARUBBER.—Still advancing, and for fine *Pará* 4s. 1d. per lb. has been paid.

INDIGO.—The rise in the Indian exchange, and the continued reports of shortage in the coming crop, which is now estimated at under 28,000 chests, are still influencing the market, and a good deal of business is being transacted privately at advancing prices, especially in *Bengal* and *Kurpah* indigo.

IODINE.—Crude, unaltered at 9d. per oz., and very firm, resublimed is quoted at 13s. 3d. and iodide of potassium at 11s. 6d. to 11s. 9d. per lb.

IPECACUANHA.—Contrary to the expectation of several buyers, there was a further rise of 3*d.* to 4*d.* per lb. at to-day's auctions. Privately 7*s.* 8*d.* to 7*s.* 9*d.* had been paid during the week, and in sale 18 serons out of 27 offered sold at 7*s.* 9*d.*, rising to 8*s.* for fair partly woody sound root, and the same prices for good to fine stout red damages. There is now nothing to be had below 8*s.* to 8*s.* 1*d.* per lb.

JALAP.—Again dearer, and held for 2*s.* per lb. for good small to hold Vera Cruz. An offer of 1*s.* 9*d.* per lb. was refused at to-day's auctions.

KOLA NUTS.—In Liverpool 2*s.* 0½*d.* per lb. was paid for dry seeds at auction this week, and at to-day's drug sales the very high price of 2*s.* per lb. was realised for mouldy dried kolos. Everything offering is bought up eagerly, and a further advance is looked for unless there should be large arrivals.

LYCOPodium.—The residuc of the old crop is now almost exhausted, and the new harvest is said to be a comparatively small one. Under these circumstances, prices are well held, and for sifted lycopodium 145*s.* c.i.f. is quoted.

MERCURIALS.—Notwithstanding the advance in quicksilver, the manufacturers of mercurials have made no change in their prices yet, English *calomel* in first hand being 3*s.* 9*d.* per lb., *corrosive sublimate* 3*s.* 1*d.*, *ointment* 2*s.* 2*d.*, *red precipitate* 3*s.* 10*d.*, *white ditto* 3*s.* 11*d.*, *blue pill* 2*s.* 2*d.*, and *vermilion* 3*s.* 4*d.* per lb.

MUSK.—A fairly large assortment offered at auction to day met with a good demand at irregular prices. One lot of fine first pile *Tonquin* brought about 1*s.* 6*d.* per oz. below valuation, but subsequent sales realised full rates. The following prices were paid:—*Tonquin* pods, first pile, seven caddies, fine small to hold, slightly damp, well trimmed thin blue skin and underskin, 80*s.*; small to hold dry, old-fashioned, well trimmed, thin skin and underskin, 75*s.* to 76*s.* per oz.; third pile, small to hold pods, dry, old-fashioned, well trimmed, 45*s.* 6*d.*, blue-skin pods, small to hold, part torn and very damp, 44*s.*; medium size, fair old-fashioned pods, 41*s.* 6*d.*; damp, skinny, and badly-trimmed pods, 29*s.* per oz.

NUX VOMICA in good demand. For 12 hags good pale and grey mixed seeds from Cochin 12*s.* was paid; while an offer of 8*s.* was refused for 77 hags small dark seeds from Bombay. For this parcel the owner wants 10*s.* per cwt.

OIL (CASTOR).—Firmly held both here and in Liverpool, while the tendency is towards a further advance. For fine Italian oil 5*d.* per lb. is wanted here, and 4½*d.* per lb. for good Calcutta firsts. In Liverpool Calcutta seconds are held at 4*d.* to 4½*d.* per lb.

OILS (ESSENTIAL).—*Star-anise* quiet but firmly held at 6*s.* 5*d.* per lb., which was the price asked at the auctions to-day for a parcel of unworked oil imported *via* Bremen. *Cassia* quiet and unaltered. Five casks *Cajaput* oil were shown, and are held for 3*s.* 11*d.* per bottle. Of *Citronella* 60 cases (of 36 bottles) sold at ¾*d.* per oz., while for *Lemon-grass* 1¾*d.* per oz. is suggested as the price. English drawn *Sandalwood* oil is quoted lower. Italian essential oils are very scarce and dear; good *Lemon* is reported to be quoted at 5*s.* 9*d.* in Messina, and fine *Bergamot* at 15*s.* The new *Otto of Rose* is still arriving, and sells at moderate prices. American oil of *Peppermint* firm at 11*s.* 6*d.* to 11*s.* 7½*d.* per lb. for H.G.H. Fisher's *Patchouly* oil is held for 1*s.* 3*d.* per oz., and for *Nutmeg* oil of the same brand 10*d.* per oz. is required; while for 6 casks (at 48 bottles each) Java nutmeg oil 5*d.* per oz. was refused.

ORRIS ROOT.—At to-day's auctions, 47 hags Italian orris, rather irregular shape and off colour, were bought in at 42*s.* per cwt., an offer of 39*s.* 6*d.* being refused. Fine *Florentine* root is exceedingly scarce, and the quotation comes at 85*s.*, f.o.b. Leghorn.

PATCHOULY LEAVES.—Two parcels were offered to-day, but both remained unsold. For 46 hales dusty and stinky dry brown leaves of fair flavour 5½*d.* per lb. is wanted; the other parcel was bought in at 6*d.* per lb.

QUASSIA.—At to-day's auctions, 36 bags of quassia, imported from the West Indian island of St. Kitt's, and chipped there, were offered for sale. This is a new departure, as

hitherto quassia has never, we believe, been chipped in the West Indies for export to Europe. The quality of the lots shown to-day was excellent, and they brought high prices: 13*l.* 5*s.* per ton for fine shavings; 9*l.* 10*s.* to 10*l.* 10*s.* for chips; while for 200 good dry logs an offer of 8*l.* per ton was refused.

QUICKSILVER.—At the beginning of this week the principal importers are reported to have sold several thousand bottles, after which they advanced their price from 10*l.* 5*s.* to 10*l.* 10*s.*, at which it has since remained. The second-hand advanced to 10*l.* 7*s.* 6*d.*, but the market has since become quieter, and to-day the quotation runs from 10*l.* 6*s.* to 10*l.* 6*s.* 6*d.* A German technical journal states that a pool has been formed in New York "on the same lines as the one existing in London, for the purpose of driving up the price of quicksilver."

QUININE.—There has been a slight reaction from the speculative energy manifested lately, and this week the market has been quiet and just a shade easier. Business has been done in German bulk on the spot at 13½*d.* per oz., and subsequently at 13¾*d.* per oz., at which price there are further sellers but no buyers. December delivery has also been done at 14½*d.* per oz. The B. & S. agents ask 1*s.* 3*d.* per oz. for October delivery.

RHUBARB.—An arrival of nearly 600 cases of rhubarb was announced in the official Customs list a few days ago, but this entry, it appears, had no foundation in fact. Nevertheless, the arrivals of rhubarb are rather heavy, and a considerable quantity of freshly-imported root will probably be offered at the next auctions. In the meantime the quantity offered to-day was a very moderate one only—viz., 56 cases, all in the hands of one broker, who sold 22 packages at very firm rates. *Shensi*, small to medium, round, fair coat, ¾ pinky, ¼ dark fracture, at 1*s.* 7*d.* to 1*s.* 8*d.*, ditto flat at 1*s.* 4*d.* per lb.; *Canton*, very wormy, common flat, 6½*d.* to 8½*d.*; *High-dried* medium to bold, fair coat, pinky fracture, at 1*s.* 2*d.* per lb.

SALEP.—For 2 hags from Alexandria an offer of 1*s.* 7*d.* per lb. was refused.

SANDALWOOD.—For 48 packages of good *East Indian* logs, fair flavour, 58*l.* per ton is required. Five hags roots are held for 8*l.*

SARSAPARILLA.—For good bright sound *Jamaica* root 1*s.* 5*d.* is paid, damages from 1*s.* 4*d.* down to 1*s.* per lb. *Honduras* root sold at 1*s.* 6*d.* per lb. for first-class damaged.

SENEGA.—Dearer. Sales of good root have been made at 1*s.* 11*d.* per lb., but to-day it is doubtful if anything could still be had at that price, and 2*s.* per lb. is asked.

SENA.—The new *Tinnerelly* crop is still coming in, the arrivals for the week being 347 bales. It is said that owing to the unusually wet weather the crop will be a very small one, and we give that rumour for what it is worth. Certain it is that the 387 bales offered for sale to-day were well competed for, 358 selling at very full prices, and occasionally about ½*d.* per lb. dearer. The bulk of the supply sold at between 1¾*d.* and 3*d.* per lb., and only a few lots brought over 5*d.* per lb. Medium to bold leaf, good green, partly slightly specky, brought from 5*d.* to 6½*d.*; fair ordinary medium and yellowish to medium greenish, 2½*d.* to 4¾*d.*; common dark and damaged to fair small yellowish, 1*d.* to 2½*d.* per lb.

SHELLAC.—In this important article a very strong speculative movement has occurred since our last report, and prices at the call close fully 6*s.* higher. At the auctions on Tuesday 499 cases were offered, the greater part of which, sold under strong competition at from 6*s.* 6*d.* to 7*s.* 6*d.* per cwt. advance on the previous week's auction rates. Since the sales the market has been excited, and at to-day's call the figures were: orange TN., sellers, 111*s.*; buyers, 109*s.*; garnet AC., sellers, 105*s.* 6*d.*; buyers, 105*s.*, for September deliveries.

TEA.—*China.* The "Terminal" Market took a further turn upwards at the end of last week but opened weaker last Monday, and on Wednesday fair common tea sold in public sale at 4¾*d.* per lb. Importers are feeding the market sparingly with new tea, and what little was offered on Tuesday sold at very full rates, showing probably 1*d.* per lb. advance on the lowest point of 6½*d.* to 7*d.* new Mouing. This, however,

is certainly not a criterion of the market, the position being that importers, knowing that dealers generally do not hold very heavy stocks of new tea, are trying very hard to squeeze the market up, whereas country buyers are filling their scanty Congou requirements from what stock dealers do hold, and they are by no means inclined to pay an advance. Scented capers remain very steady, and common new tea selling at 6½*d.* is terribly dear. New Oolongs are being offered, and fetch good prices. *Assams* are firm, and it is difficult to get Pekoes with any liquor at 9*d.*, though poor liquoring teas for leaf may be had at 8*d.* to 8½*d.* Pekoe Souchongs with any pretensions to liquor fetch 7½*d.* to 8*d.*, but broken Pekoes are now coming in better, and very good liquoring teas may be had from 1*s.* to 1*s.* 4*d.* by watching the market carefully. *Ceylons* show a very healthy tone, a heavy sale on Tuesday being taken at steady prices, and they are going freely into consumption. There is a general feeling that at any rate there is no likelihood of a fall in prices, while there is a considerable probability of a dearer market if public auctions fall off in quantity.

WAX (BEES').—The demand remains exceptionally good, and full prices are obtainable for all varieties. Carnunba wax has been in strong demand. At auction to-day 75*s.* is the price. Japan wax is dearer, 47*s.* having been paid for good pale squares.

CHEMICALS IN THE NORTH OF ENGLAND.

WITH the exception of bleaching-powder, which has declined in value in the Liverpool market, heavy chemicals have continued steady in price during the past week, and a fair amount of business has been transacted. Caustic soda, especially, has been in great demand, and makers are pretty well cleared out of stocks. Prices have had another sharp rise, and for spot parcels quotations rule higher than the rates quoted by the executive committee of the Chemical Union for deliveries over the next year.

BICARBONATE OF SODA remains steady and firm at 5*l.* 15*s.* to 5*l.* 17*s.* 6*d.* per ton, less 2½ per cent. discount for 1-cwt. kegs f.o.b. Liverpool, prompt shipment, with usual allowances for larger packages.

BLEACHING-POWDER is again quiet, and Lancashire market easy for prompt. Tyne market rather firmer, after large sales at low figures. Some sales of bleach to paper-makers for the whole of next year at combination prices are reported. Quotations for prompt are 5*l.* 5*s.* to 5*l.* 7*s.* 6*d.* per ton in softwood casks, f.o.r. Widnes or St. Helen's, and 5*l.* 15*s.* to 6*l.* per ton in hardwood casks f.o.b. Liverpool, both less 2½ per cent. discount. Glasgow prices 5*l.* 2*s.* 6*d.* to 5*l.* 5*s.* per ton on rails. Tyne makers quote 5*l.* 2*s.* 6*d.* to 5*l.* 5*s.* per ton for softwoods, and 5*l.* 7*s.* 6*d.* to 5*l.* 10*s.* per ton for hardwood casks f.o.b. For delivery ex ship Thames, price is 5*l.* 12*s.* 6*d.* to 5*l.* 15*s.* per ton. If taken in 1, 1½, or 3 cwt. casks, the usual extras of 20*s.*, 15*s.*, and 5*s.* per ton respectively charged. For forward delivery combination prices are same as previously quoted.

CAUSTIC SODA very scarce for prompt, stocks being almost cleared out. For 60-per-cent. white makers ask 9*l.* 12*s.* 6*d.* to 9*l.* 15*s.* per ton; 70-per-cent., 10*l.* 12*s.* 6*d.* to 10*l.* 15*s.* per ton; and 74-per-cent., 11*l.* 5*s.* per ton, f.o.b. Liverpool, less 2½ per cent. discount. Current quotations are good for the whole of September delivery; but for October to December prices are 10*l.* 7*s.* 6*d.* to 10*l.* 10*s.* per ton for 70-per-cent., and 10*l.* 10*s.* per ton over next year. Some business reported at the latter figure for next year's delivery. 77-per-cent. white unchanged, and makers ask 11*l.* per ton for delivery to end of year, and 14*l.* per ton for ground caustic, packed in 3-4-cwt. barrels, f.o.b. Tyne, and net cash.

CREAM (CAUSTIC).—Scarce and firm, at 8*l.* 10*s.* to 8*l.* 15*s.*, on rails; and 8*l.* 15*s.* to 9*l.* per ton f.o.b. Liverpool, less 2½ per cent. discount, prompt delivery.

CHLORATE OF POTASH.—Steady, and price firmer—5*d.* to 5½*d.* asked for this month's delivery, 5½*d.* for Oct.-Dec., and 6*d.* over next year, at usual ports of shipment.

HYPOSULPHITE OF SODA.—Steady in price, and demand

increasing both for home preparation and for export orders. Large quantities are being shipped to South America for silver extraction. Prices are: 6*l.* per ton for kegs, and 5*l.* 10*s.* per ton for casks, less 2½ per cent. discount, f.o.b. Tyne, and 6*l.* 5*s.* and 6*l.* 15*s.* per ton, in quantity, for casks and kegs respectively, delivered Liverpool and Manchester, with usual discount.

SODA ASH.—Rather more inquiry, some makers being fully sold to end of the year. *Caustic* quoted 1½*d.* per degree, and *Carbonated* 1½*d.* to 1½*d.* per degree, less 2½ per cent. discount, f.o.b. Liverpool. For export orders in strong 3-4-cwt. barrels, price is 1½*d.* per degree f.o.b. Liverpool. Tyne market unchanged, and makers ask 1½*d.* per degree, less 5 to 6 per cent., f.o.b. Tyne. Forward quotations as previously reported.

SODA CRYSTALS.—Steady, with good demand 3*l.* to 3*l.* 2*s.* 6*d.* per ton on rails, and 3*l.* 5*s.* to 3*l.* 7*s.* 6*d.* per ton f.o.b. Liverpool, in 3-cwt. barrels, net weight. Tyne quotations 56*s.* per ton, gross weight, in usual-sized casks. For delivery ex ship Thames price is about 3*l.* 2*s.* 6*d.* per ton, gross weight.

SULPHATE OF COPPER.—Quiet, and little doing for prompt. Prices are 17*l.* 15*s.* to 18*l.* per ton, less 5 per cent. discount, f.o.b. Liverpool. More business in forward deliveries at prices ranging from 18*l.* 10*s.* to 19*l.* per ton.

SULPHATE OF SODA.—Firm at 32*s.* 6*d.* per ton in bulk, on rails Widnes and St. Helen's, for prompt, and 40*s.* per ton October-December. For delivery over next year makers ask 45*s.* per ton. A little more doing in this article on Tyneside at 30*s.* per ton in bulk; and 41*s.* to 42*s.* per ton in casks.

THE GERMAN MARKETS.

HAMBURG, September 2.

A DISTINCT improvement has occurred in our drug trade since last week. There has not been much doing for consuming purposes, but in several departments there is a decidedly more hopeful feeling, and it is believed that there is every prospect of a profitable and brisk autumn trade. We quote higher: balsam copaiba, calumba, camphor, elemi, honey, jalap, galangal, Mexican sarsaparilla, senega, oil of peppermint, quinine, bees'-wax, and Japan wax; on the other hand, spermaceti has had to give way still further.

ANTIMONY.—Our stock is decreasing rapidly, and the owners of crude Japanese antimony require higher prices.

AGAR AGAR.—Scarce and rather dearer.

BALSAMS.—There is more trade in copaiba, which is not offering from the first hand. All grades are quoted dearer, at figures ranging from 4-35*m.* to 4-75*m.* Peruvian balsam is firmly held by the speculators, and if we may believe the reports from the producing countries, a further rise is imminent. Nothing is offering in the article from the first hand.

CAMPHOR.—Speculators are again endeavouring to inflate this drug, but they do not meet with much confidence among the trade. In fact, there is very little basis for an advance, the stock of raw material being heavy, while there are also large supplies of refined camphor in the hands of the speculators.

CALUMBA.—All our available stock has been bought up by speculators, and at present good sorts are scarcely obtainable at 40*m.*

JALAP.—The 57 bales imported here have found ready purchasers at advancing prices. The quality left much to be desired in part, some lots being almost unfit for use. Prime quality is no longer obtainable under 3-75*m.*

SPERMACETI is lower, and offering at 3*m.*

WAX (JAPAN).—Heavy transactions have taken place at advancing prices, 92*m.* having been actually paid for good white squares.

WAX (BEES').—All varieties remain much inquired for. About 30 packages which were imported from Chile have been bought up at high prices. A large shipment of Mogadore wax is being landed.



Memoranda for Correspondents.

Always send your proper name and address: we do not publish them unless you wish: if you do not, please use a distinctive nom-de-plume.

Write on one side of the paper only; and devote a separate piece of paper to each query if you ask more than one, or if you are writing about other matters at the same time.

If you send us newspapers, please mark what you wish us to read.

Ask us anything of pharmaceutical interest: we shall do our best to reply.

Before writing for formulae consult the last volume, if you have it.

Letters, queries, &c., will be attended to in the order received.

Mixing Sulphur and Nitre—Explosion.

SIR,—On August 2 a fire broke out in my shop, and up to the present its origin is involved in doubt.

My apprentice had been mixing sulphur and nitre for a horse, and as the customer was waiting he used a fair amount of pressure in the mortar. He replaced the drawers into their nest, the same as occupied by them for more than sixty years, and about half an hour after I was startled by the sudden rush of flames through the front of the nitre drawer; a stream of liquid fire ran along behind the counter, and at the same time flames and smoke travelled behind the nest (which had been set away from the wall about three inches to keep contents free from damp).

I write to caution others who most likely often have to mix sulphur and nitre (and, like myself, have done so for years); also to inquire if any of your readers have experienced a like result. I attribute it to an impurity (probably chlorate of potash) by some means present near the runner of the drawer, in contact with a few grains of sulphur from the drawer above.

20 Market Place, Margate.

W. S. HARVEY.

Licences.

SIR,—Mr. Richards thinks that by having the renewal of the methylated-spirit licence falling due at the same time as the patent-medicine licence the work of the department might be somewhat lessened.

About ten days ago an official from the Inland Revenue Office called to see if I intended to renew my patent-medicine licence; then he called again with the official notice to pay, which notice must be delivered when the licence is paid—in all, three distinct calls for the collection of a five-billing licence.

From the above I cannot conceive of the department having any desire to lessen the work in connection with the renewal of licences.

Edinburgh, August 30.

I am, &c.,

J. A. FORRET.

The Development of Stores.

SIR,—I could not help thinking that your leading article, entitled "The Forthcoming Pharmacy Bill," in last week's issue, was a little unduly hard on the Pharmaceutical Society: for, in framing a Bill for Parliament, the Council are naturally careful to avoid, as far as possible, any clause which would bring about the defeat of the whole measure; and, surely, if the Bill were to strike at such colossal corporations as the Army and Navy, Civil Service, and Law Supply Associations, the opposition of personally interested members of Parliament would be overwelming, to say nothing of the pressure which would be brought to bear on them by the directors and members of these huge omnivora. And if the small and daily-increasing fry of company-druggists are shadowing under the wings of the great originators, how is it possible to exterminate the former unless the very root of the evil can be struck at? We have only to remember that

all grades of the nobility (with influence which is co-extensive with the British Empire) are supporters of the above-named "Stores," to realise how futile would be any attempt to block up these channels of cheap physics.

You refer in your article to the case which the Society took up to the House of Lords, and you seem to think that this should have spurred them on to obtain a decree from the Legislature relative to the grievance; but on the hypothesis that the dog which has had his tail burnt avoids the flame, it seems only natural that the Pharmaceutical Council should be very chary how they broach this particular matter to Parliament. They probably look upon their lost case as a test one, and are satisfied that the translation of the Act by the Law Lords on that occasion must be taken as a final decision.

Yours obediently,

OFFICINA. (126/47.)

[It was a final decision of the law as it stands, of course; the question is whether the law should not be amended. It is probable that the great established co-operative stores could not be interfered with, but it is not beyond human genius to leave them alone and yet to prevent the absurdity of permitting, in face of the Pharmacy Act, any seven persons to assume the title of "chemist and druggist" by simply registering themselves as a joint-stock company.]

Unexpected Henbane.

SIR,—Your correspondent "Phoenix" is surprised at the occurrence at Spilsby of this plant, and its peculiar source, viz., from the screenings of wheat. I thought it might interest him to know that on the Eastern and Western Greens at Penzance some thirty-seven species of foreign plants have been found growing, the seeds being propagated from the waste and screenings of corn. Mr. W. Glosson, of Penzance, contributed a most interesting paper on these plants to the Transactions of the Penzance Natural History Society, he having discovered most of them. Mr. H. Weymouth also found the *Trigonella camlæa* growing at Gwitbian, which plant is a native of Bohemia and Switzerland. Its flowers, of a delicate blue colour, possess a penetrating odour like that of balsam of Peru. This odour increases in drying and is employed by Italian perfumers to mix with other preparations. The Swiss use it to give an aroma to some of their cheeses. I am indebted to Mr. W. Glosson's paper for these remarks, and must refer those interested in the matter to that paper. These species found at Penzance are representative of sixteen natural orders.

Yours faithfully,

Reading.

STYRAX. (126/48.)

SIR,—The occurrence of plants of *hyoscyamus* under such circumstances as described by "Phoenix" is not at all an unusual event. It has quite a habit of cropping up in fresh places, enduring for a short period, and then disappearing as mysteriously as it came. Many alien plants are found where grain-screenings or wool-waste are thrown out of mills. In Yorkshire alone, during the past two seasons, I have observed a far greater number of exotics in such situations than you would care to allow space for were I to attempt to enumerate them. The study of these casual plants presents many interesting problems for the botanist to solve. The greater part of them are Continental, although strays from such distant lands as Australia and California are by no means rare. Many of them endure for a single season only, but others, like *Potentilla Norvegica*, *Sisymbrium pannonicum*, *Melilotus parviflorus*, *Amsinckia lycopoides*, and several species of *Malva*, hold their own in competition with our native species, and appear to be spreading.

The particular plants mentioned by "Phoenix" are not, as far as I am aware, natives of Australia, and were probably introduced with grain, manure, or rubbish from some other quarter. Hooker states that the genus *Hyoscyamus* is distributed through warm and temperate Europe, Africa, and Asia, and, of course, it is a genuine native of the British Islands.

Yours truly,

32 Langham Street, Ashton-under-Lyne, J. A. WHIELDON.
August 30.

Sulpho-Ricinolic Acid.

SIR,—In your issue of August 2 you insert an extract from a paper read by Mr. Fred. B. Kilmer last year at San Francisco, &c., upon "Oleite or Ricinol Sulphonate of Soda," which paper is also quoted by Mr. W. A. H. Naylor. The subject of the paper is interesting, but unfortunately lacks novelty. Some seven years ago a United States patent was taken out by Dr. Müller-Jacobs, of Moscow, Russia, for the manufacture of sulpho-ricinolic acid. The doctor visited this country and founded a firm here called the "America Turkey-red Oil Company," which firm is in successful operation up to this time.

I had the pleasure of meeting Dr. Jacobs at that time and conversing with him upon the properties of his invention, to which, for its applications in pharmacy, he gave the name of "Polysolve." According to Dr. Jacobs's expectations, a wide field of usefulness was opened for sulpho-ricinolic acid, but its only successful application so far appears to be as a solvent for alizarine in the Turkey-red dyeing process.

Yours truly,

1309 Third Avenue, New York,

THOMAS LATHAM.

August 13.

Cupidity of Druggists.

SIR,—I had the following prescription brought me by a young person to dispense, who informed me that the medical man said that on no account was more than 1s. 6d. to be paid for it:—

Liq. ferri perchlor. ..	..	..	..	3v.
Liq. strychnie ..	..	..	..	3xiiiss.
Potass. bromid. ..	..	..	..	3iij. 3ij.
Aq. ad ..	..	..	..	3xx.

M.

Dose: A teaspoonful in water three times a day.

I respectfully refused to prepare it at the price mentioned, and declined to make it up at all in such a form, as I considered it was unsafe that so large a mixture composed of such ingredients should be allowed about in any household, however careful the patient might be personally. They were indignant, and said they should report my refusal to their medical man! You will see it is about equal to $7\frac{1}{2}$ grains of strychnia, contains (if correctly measured) 160 doses, which should last 53 days. What are we coming to?

MIDLANDS. (125/57.)

Preston Salts.

SIR,—Mr. W. W. Bartlett's formula for Preston salts would, I think, be made more comparable with the original if he added a trace of ol. menth. virid., which I have always understood was contained in the old, original formula. I myself always use it, and find it appreciated, giving a blended perfume not attainable otherwise.

Yours truly,

August 30.

W. B. (125/56.)

DISPENSING NOTES.

The opinions of practical readers are invited on subjects discussed under this heading.

A Pill Problem.

SIR,—Can the following be made so as not to weigh more than 5 grains:—

	Grains
Pepsin. porci (Bullock's) ..	.. .. 3
Acid. carbolic. ..	.. .. 1
Quin. snlph. ..	.. .. $\frac{1}{2}$

Ft. pil. f.

There seems to be a chemical action between the acid and pepsin, as they go nearly liquid. Sorry to trouble you, but the pill has given two or three assistants the same bother.

Yours respectfully,

BRIGHTON. (116/40.)

An Awkward Pomade.

R. F. wishes to know how the following ought to be dispensed:—

Ac. benzoici ..	..	..	..	3ij.
P. zinci oxidi ..	..	..	..	3iij.
Lin. calcis. ..	..	..	..	3iij.
Ol. lavand. ..	..	..	..	gtt. v.

Ft. pomad.

[The acid benzoici reacts upon lin. calcis, forming a soft plastic mass, with the separation of a watery fluid. We should recommend the addition of lanolin 3iij. to the formula, when a nice pomade may be made. Of course you should obtain the doctor's sanction for the change.]

A Muddy Mixture.

126/9. C. E. J. sends:—

Pot. iodidi ..	..	..	..	3j.
Sodii iod. ..	..	..	..	3j.
Tr. belladon. ..	..	..	..	3v.
Sodii brom. ..	..	..	..	3iij.
Ferri tart. ..	..	..	..	3ij.
Aq. pur. ..	..	..	..	3viij.

M.

He can only get a muddy mixture, but says it has been dispensed clear somewhere. How? [Dispensed as written it does give a thickish mixture, which, on standing, deposits, leaving a clear deep brown fluid portion. We find the best result by dissolving ferr. tart. in half the quantity of aq. dest., the other saline ingredients in the remainder of aqua; mix; then add tr. belladonnæ. We notice the precipitate forms principally after the addition of the tr. belladonnæ. It may have been filtered, or possibly ferri et am. cit. may have been used; in either case the dispenser was at fault.]

LEGAL QUERIES.

123/53. W. S. H.—If you publish details of any process or novelty which you have not patented or registered you cannot claim compensation from anyone adopting a similar device without your consent.

J. G. S. writes:—"Please inform me the way to protect a proprietary—not simply by affixing a stamp, but for affording absolute protection from imitation in any way whatever. The information I desire would apply equally to a proprietary, whether to be taken as a medicine or for external use only—is it so?" [How can a comprehensive question of this kind be answered? If "J. G. S." will look up trade-mark cases, patent disputes, and actions alleging colourable imitations, he will see how difficult his conditions are. He had better consult a patent agent.]

125/65. Trade Mark.—We should think label No. 2 would be accepted. You would have to state what you claim as the essential feature. The cost would be 5s. on application and 20s. on registration. You are doubtless aware that the labels render the powder liable to a medicine stamp.

126/45. Lavender.—We do not think any firm could establish an exclusive title to lavender salts, though a certain firm has put forward such a claim. You had better try to avoid imitating the style of anyone else's get-up.

126/63. Medicus.—A fully-qualified medical man is entitled to sell poisons. There is no restriction of the right to dispense (apart from selling poisons) in Great Britain at present.

127/28. P. C.—A Customs and Inland Revenue Bill passed last Session provides that "every excise licence to carry on any trade or business (except the trade or business of an appraiser, auctioneer, or hawker) which shall hereafter

be granted shall only authorise the person to whom the licence is granted to carry on the trade or business mentioned therein in one set of premises to be specified in the licence.' This applies to medicine-licences.

MISCELLANEOUS INQUIRIES.

A large number of correspondents ask us for formulæ and other information already published in this journal. It is not fair to more careful readers that we should frequently repeat such information, and so long as the back numbers containing the formulæ or replies required are in print we must decline to do so. Back numbers of our weekly issue can be obtained from the publisher at 4d. each.

Correspondents who have made inquiries regarding the following subjects will find the information in the numbers indicated.

123/18. *De Bello*.—Hop Tonic.—See THE CHEMIST AND DRUGGIST, January 19, 1889, page 95.

124/9. *W. S.*—Carbolic Tooth-powder.—See THE CHEMIST AND DRUGGIST, July 27, 1889, page 156.

122/45. *French*.—We shall deal with the matter in our Educational number.

123/25. *Dens*.—We never heard of the phenomenon before, but should say that the action is mechanical.

165/20. *W. B. S.*—Lin. Crinale (Squire).—Cantharidin, 1 grain; acetic ether, 6 drachms. Dissolve, and add rectified spirit, 3 oz.; castor oil, 1 oz.; oil of lavender, 15 minims.

126/49. *Oleum*.—You are fortunate in having such a fine sample of lavender oil. This is one of a class of oils which improve greatly by keeping. Otto of rose is none the worse for age, but it does not improve like lavender, nor does neroli.

124/57. *Pylorus*.—No, thanks; our curiosity is satisfied. Hypophosphite is obviously the active agent.

124/42. *Cinnamon*.—You omit to tell us what dose of the powder you give. The antimonial powder will in certain cases induce sickness.

278/90. *F. J. H.*—The ointment is Hebra's diachylon ointment, and is composed of equal parts of lead-plaster and olive oil, perfumed with lavender oil.

123/39. *T. B.*—White Tooth-cream.—Use any white tooth-powder you may desire, and make into a paste with a mixture of glycerine, 1 part, and water, 2 parts.

123/66. *Mac*.—Oil of Ivy.—You can make this by digesting 1 part of chopped fresh ivy leaves in 4 parts of olive oil over a water-bath until all moisture is evaporated, then set aside for a day or two and strain.

123/65. *Inquirer*.—We have frequently explained why quinine and iron perchloride mixtures with glycerine deposit. The ferric salt is reduced to the ferrous state by the glycerine, and in the course of the reaction part of the quinine goes out of solution, and part of the iron is reduced to hydrate.

123/36. *H. B. Clegg*.—We gave particulars in our last Educational number (September 21, 1889), and will repeat in our next.

122/52. *J. S. K.*—We cannot attempt to give formulæ for perfumes by smelling samples submitted to us. As the information would appear to be of value to you, we suggest that you should consult a perfume manufacturer.

122/73. *Scruple*.—As we have succeeded often in making the oils according to the directions given, we can only conclude that you have been faulty in your manipulation.

123/19. *Ginger*.—(1) We have not heard of a "Soluble Gingerine"; it is trouble enough to get the essence perfectly soluble. You might try some of the houses who devote themselves exclusively to this trade; but we do not appreciate the necessity for anything else than a soluble essence. (2) *Hypodermic Purgative*.—You do not appear to be aware of the fact that most purgatives act by irritating the intestines, and to get at that it would obviously be a roundabout and dangerous way to inject the medicine into the blood-vessels. (3) *Emetine* is a powerful emetic because it is an exceedingly powerful depressant. For that reason it is not given hypodermically. (4) The Junior Pharmacy Club has been formed; we reported the fact two months ago.

126/29. *Lux Beata*.—(1) *Bay Rhum and Neat's-foot Oil*.—We do not know a formula, but should think equal parts. The oil must be nicely purified; a Dublin firm used to put up a form of oil that would suit your purpose, under the name of trotter oil. (2) *Self-inking Pads* for rubber-stamps are generally made of felt or amadou.

111/29. *Soapaline*.—It is impossible from your description to arrive at a formula. We are not aware of Quillaia being used for removing paint, &c.

125/45. *Villegas*.—(1) *Manner of Preparation of Hydrogen Dioxide*.—See last week's issue, page 284. It is the best commercial process we have seen. For further information see Watts's "Dictionary of Chemistry." (2) *Vin. Quin. et Ferri*.—The only official formula we have seen is that of the U.S. Pharmacopœia, under the title of "Vin. Ferri Amarum":—

	Parts
Sol. ferri et quin. cit.	8
Tr. aurantii	12
Syrupi	36
Vin. alb. fort.	44
M. et filit.	

Sol. ferri et quin. cit. contains 6 per cent. quinine. Vin. album fort. is vin. album, 7 parts; alcohol, 1 part. You can easily make a similar preparation by dissolving ferri et quin. cit. in vin. aurant. with small quantity of ac. citric and syrup added.

112/12. *R. N.*—There is nothing better to Silver either Cachous or Pills than silver leaf and mucilage. Use a smooth burnisher and polished steel plate to finish. A little practice will enable you to give them a nice bright appearance. You could make a pure silver powder by triturating silver leaf with weak mucilage and washing by decantation.

Information Wanted.

[Replies to the following requests are solicited by correspondents of THE CHEMIST AND DRUGGIST.]

125/58. Maker of a yellow arsenical sheep-dipping powder (free sulphur and sulpho-arsenite of sodium) packed by several firms.

124/53. Maker of cheap small presses for making toilet soaps.

126/4. Mercury baths in London.

THE MODEL NORDLAND FISHING BOAT

Those who wish to make a display of the Oil on their counters or in their windows are recommended to obtain one of these unique and beautiful models, which have in so many cases been found useful in increasing the sale of the Oil.

These Models, made specially for us in Norway, are very picturesque, well built, and behave admirably in water. Each boat possesses oars, in addition to its sail, and is complete in every respect. It is also fitted with a cabin on deck, as used by the fishermen in travelling from their homes to the fishing ground. They measure 28 inches from stem to stern, and 32 inches to top of mast.

The Boats are intended for the interior of shops and windows as an attraction and advertisement, and are only supplied to purchasers of the "A 1" Oil; the price fixed is very moderate—namely 10/- each.

For the convenience of Chemists, and to secure the "A 1" COD LIVER OIL being placed in the hands of the Public perfectly sweet, we have packed it in 8-oz. and 16-oz. green flint oval and flat bottles, at the LOWEST POSSIBLE PRICE.

The bottles are sent out either without labels of any kind, or with the blue trade mark labels over the cork, and are either plain or capsuled. The corks are of best quality, and the bottles are packed in boxes with divisions specially made for the purpose, which are charged, but full prices are allowed when returned in good condition. It will be obvious that by bottling from the original casks, which have not been opened since they left the factory in Norway, the Oil in these small bottles must be in the most perfect condition.



PRICES FOR THE HOME TRADE ONLY.

In Dispensing Bottles—containing 8 oz. fluid	By 6-doz. case.	12-doz. case.	24-doz. case.	doz. to a/c.
	- - 6/3	6/	5/9	
„ 16 oz. „	By 3-doz. case.	6-doz. case.	12-doz. case.	„
	- - 11/6	11/3	11/	
CARRIAGE FREE.				

N.B.—If less than these quantities are ordered, carriage must be paid by the Customer, unless the order is made up to the value of £5 with drugs.

SOUTHALL BROS. & BARCLAY, BIRMINGHAM.

The BEST and CHEAPEST BEVERAGE

IN EXISTENCE IS

VAN HOUTEN'S COCOA

RICH YET DIGESTIBLE

STIMULATING YET SUSTAINING

SAVING WHAT OTHER PROCESSES WASTE

DEVELOPING THE

DELICIOUS FLAVOUR & AROMA

AND FORMING A

DRINK FOR A PRINCE

AT LESS THAN A FARTHING A CUP.



BICARBONATE OF SODA,

REFINED AND RECRYSTALLIZED.
PURE AND CHEAP.

ANALYSIS.

Bicarbonate of Soda	...	...	...	...	97.20
Mono Carbonate of Soda	...	...	...	...	1.90
Sulphate of Soda	...	...	...	...	trace
Chloride of Sodium	...	...	...	...	.035
Moisture	...	...	...	...	.82
Insoluble	...	...	...	...	nil

PURE ALKALI,

GUARANTEED 58 DEGREES,
EQUAL TO 98 PER CENT. OF CARBONATE OF SODA.

Most economical form of Soda for the use of Printers,
Bleachers, Dyers; Glass, Paper, and Soap Makers.

SODA CRYSTALS

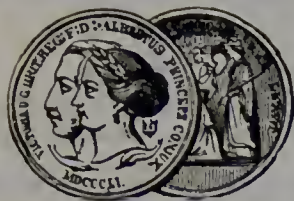
OF THE FINEST QUALITY.

BRUNNER, MOND & CO., LIM.

*Manufacturers of Soda by the Ammonia Process
(Solvay's & Mond's Patents),*

NORTHWICH, CHESHIRE.

Branch House: HOPKIN & WILLIAMS, 16 CROSS ST., HATTON GARDEN, LONDON, E.C.



Established
1798



Howards & Sons

QUININE, CINCHONA ALKALOIDS,

Acetates of Soda & Potash
Acids, pure.
Æthers, pure & methylated.
Antimony preparations.
Benzoic Acid & Benzoates.
Bicarbonate of Potash.
Bicarbonate of Soda (Howards').
Bismuth preparations.
Borax & Boracic Acid.
Bromides of the Alkalies.
Caffeine.
Caffeine Citrate, P.B.
Camphor Bells, Blocks, & Flowers.
Citrate of Iron & Quinine, P.B.

Citric Acid & Citrates.
Cocaine and its Salts.
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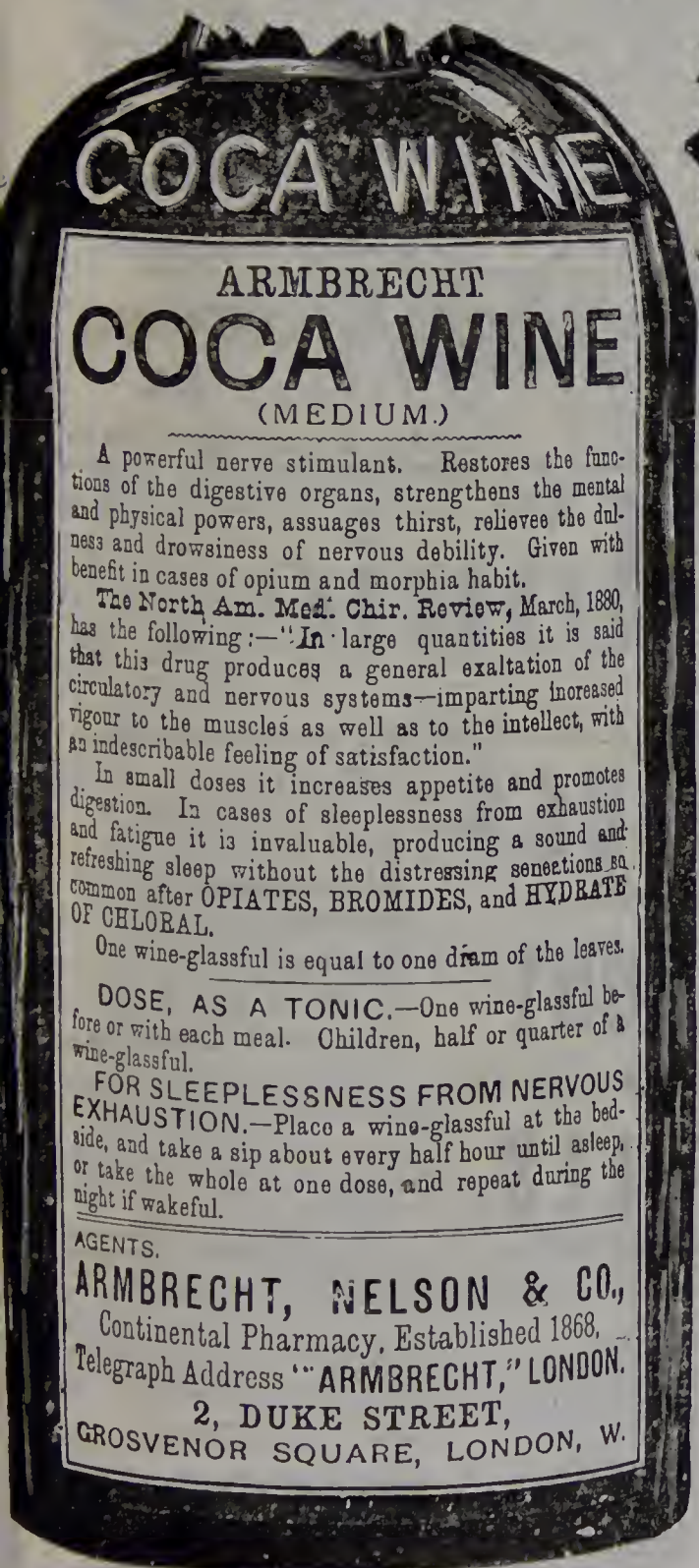
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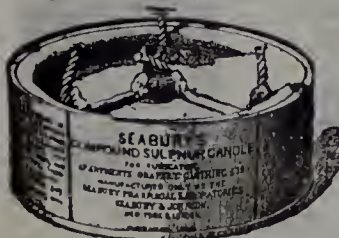


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From *The Chemist and Druggist*, Dec. 22, 1888:—"A compound sulphur candle is a novelty which ought to sell freely. It offers an easy means of supplying sulphurous acid gas in apartments, to clothing, &c. It is a mass of sulphur with a wick, all enclosed in tin, and capable of being sold for 1s."



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At the Paris Exhibition, 1889, for
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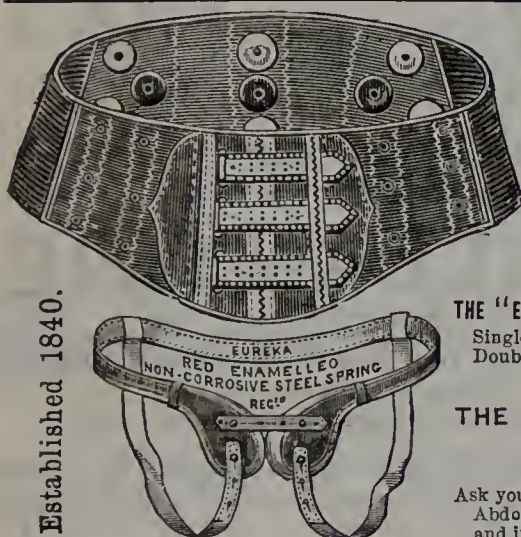
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SOLE AGENTS FOR DR. WARLDMONT'S CALF VACCINE.

Tubes, 2s. each; Half Tubes, 1s. each. Pomade in vials, 6s.
HUMAN VACCINE, from healthy children only, microscopically examined and once quoted. Tubes, two-thirds full, 1s. 9d. each; Tubes one-third full and Lancet-charged points, 1s. each; Pin-points, 1s. 1d. each. Eighteen charged Small Points, 6s. Tubes, two-thirds full (same as those mentioned above, but without source), in quantities for export, £5 per 100 Tubes. Pin-points uncharged, 1s. per dozen. Vaccine Ejectors, 1s. 3d. each, including postage. Vaccinations by appointment. P.O.O.'s (including postage, and crossed London and Westminster Bank) with orders, payable to
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THE "EUREKA" GALVANO-ELECTRIC CONTINUOUS BATTERY BELTS.

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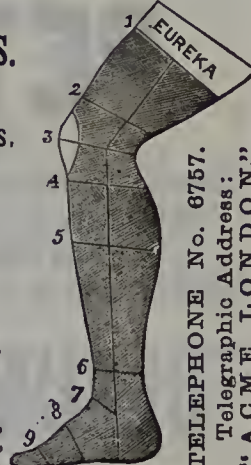
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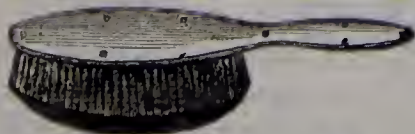
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Universally adopted by the Medical Profession
FOR

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EXTERNAL & INTERNAL IRRITATION
OF EVERY KIND.

PACKED IN CASES—

One Doz. 1s. 6d. Bottles; One Doz. 2s. 6d. Bottles
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WOODS' ARECA NUT TOOTH PASTE,

As used and recommended by Madame
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THE GENUINE
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	Size	Size	Size
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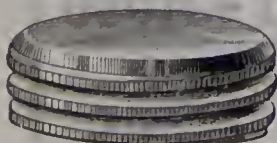
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REGISTERED

It Preserves, Beautifies, and renders the Teeth perfectly White without injuring the enamel. It Strengthens the Gums. It is most Agreeable as a Mouth-wash, and Sweetens the Breath. It is Invaluable to Smokers. Prices: 1/3 size, 9/-; 2/ size, 15/-; 3/6 size, 24/- per dozen.

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Vast is the difference between a "Crème" Tooth Paste and a Tooth Paste. Americans have used the above for 15 years. It is the only "Crème" Tooth Paste sold in England. It cleanses the Teeth, perfumes the Breath, and removes Tartar.

CHINA JARS, 2/- SILVER TUBES, 1/-

The beautiful way in which the "Crème" Tooth Paste is "got up" alone secures its sale. There is not another preparation in the United Kingdom which is turned out so well. Show Cards and Circulars with all orders of 1 Dozen upwards.

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With every dozen full-sized Tubes or Jars ordered in first order, we will give 1 dozen Sample Tubes or Jars. The samples are 1/4-size facsimiles. Write for Special Terms and Samples.

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Musk Civet Ambergris Attar - of - Rose**ESSENTIAL OILS**Wholesale
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WILLIAM TOOGOOD'S

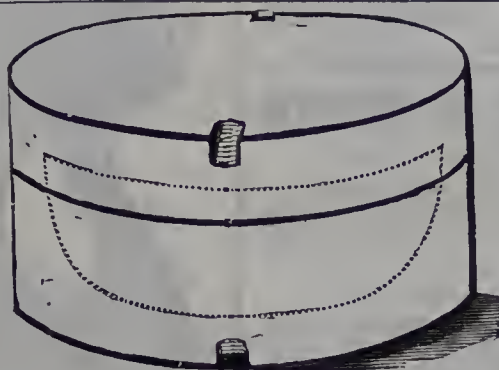
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Are claimed to be the most
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Owing to the increasing demand
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These Pots are beautifully
glazed and finished, and, being
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for sending by post.

ORDINARY THICKNESS—

1 dr.	2 dr.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	6	8 ounces.
1/6	1/6	1/6	1/8	1/10	2/	2/3	2/10	3/6	4/6	5/6 per doz.

THIN FOR DISPENSING—

$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	6	8 ounces.
1/7	1/9	2/	2/2	2/5	3/	4/	5/	6/ per doz.

THE LACTOTHERME

(REGISTERED TRADE MARK) OR

INFANTS' PORTABLE MILK STOVE,

Patented in England and Abroad.

ADVANTAGES.

The Lactotherme heats milk exactly to the proper temperature at which it should be given to Infants, viz., 98 degrees Fahrenheit, this being the temperature of the milk from the mother's breast.

The Lactotherme does not cause the milk to turn sour.

The Lactotherme greatly benefits the health of Infants, as by giving food at a proper temperature, Colic, Diarrhoea, and Convulsions are guarded against.

The Lactotherme is portable, and may be as effectively used in a Railway Carriage as in the Nursery.

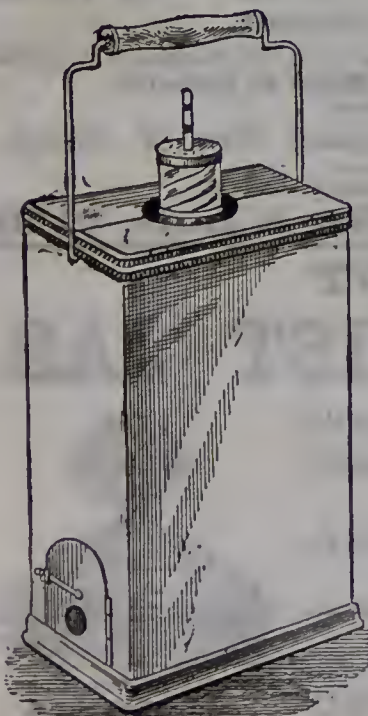
The Lactotherme will be also found a boon to Invalids for keeping warm Beef Tea, &c., during the night.

The Lactotherme is safe, cleanly, and effective, and burns without smell.

WHOLESALE PRICES.

No. 1. Japanned Iron, 6/- each. No. 2. Polished Brass, 8/6 each.
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Each Apparatus is furnished complete with Thermometer, Box of Prepared Carbon, Box of Wicks, and Float.



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51/- per dozen.

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Reduces lumpy powders, sifts and mixes faster, and makes a more perfect blend than any Machine in the Market.

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Highest Award, Edinburgh, 1886; Highest Award, Melbourne, 1889;
HIGHEST AWARD, PARIS, 1889.

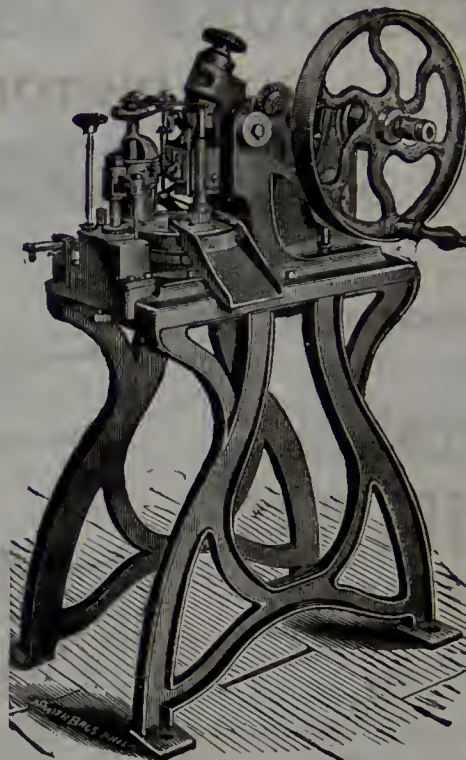


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Kneading Machines for Pill Masses.
Mixing Machines for Emulsions.
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McFERRAN'S
COMPRESSED
TABLET MACHINES,

Of various Sizes and Prices.

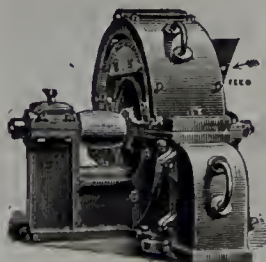


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Nos. 4 & 5.—For Retail Druggists and Limited Manufacturing Purposes—
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Will Pulverise, Granulate, or Shred almost any Mineral, Vegetable, or Animal Substance.



NEARLY 1,600 IN USE
In all parts of the World.

For Grinding Sugar, Bark, Linseed, Ginger, Pepper, Spices, Salt, &c., this Machine is invaluable
Made in 9 Sizes. Illustrated Catalogue may be obtained on application.

Samples of ANY Material will be Ground free of charge.

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NEW PATENT
AIR-TIGHT CHEMIST JAR.

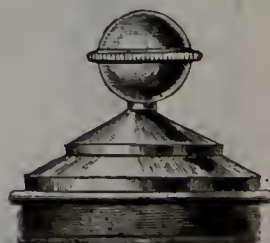
A slight turn of the knob presses the indiarubber Band against the glass, and renders the vessel absolutely air-tight. The Stopper is made of pure Nickel, of handsome shape.

INVALUABLE FOR SHOW BOTTLES, CHEMISTS, CONFECTIONERS, &c.

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37 CRUTCHED FRIARS, MARK LANE, E.C.



Section of the Nickel Stopper when closed.

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1,000 SOLD IN TWELVE MONTHS. CAN BE SEEN AT WORK IN ALL TOWNS.

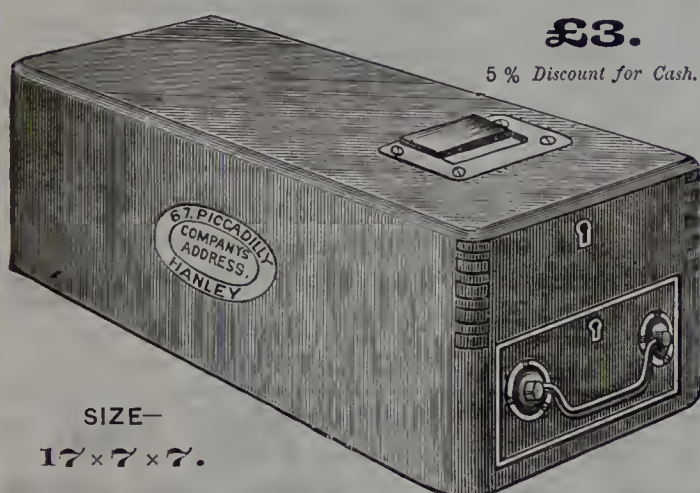
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A system of checking receipts can give offence to no honest person.

Stokes' system gives employers thirteen advantages over Open Tills, and thus the outlay incurred is the best-spent money a business man can spend.

Showing Till Closed and ready for use :—



Occupies only half the counter-space required by all other systems.

THIS IS AN EXACT COPY OF PAPER EMPLOYED IN TILL,

Showing how it can be adapted to any purpose.

PAYMENTS.

RECEIPTS.

1		4	
5	4	S mith a /c.	
Williams		2	4
J.	T.	3	4
Um brella		1	1
3	2		Wages
5	4		Ca rriage

No. of Salesman, and amount of sale.

Payment of a/c. owing by you.

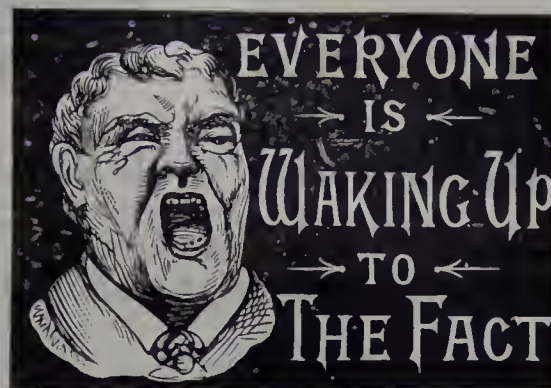
Payment of a/c. owing to you.

Initials of Salesman, and amount of sale.

Particularising articles sold.

Money taken out of Till.

Do. do.



THAT

STOKES' PATENT CHECK TILL
IS INVALUABLE.

THIRTEEN ADVANTAGES
OVER OPEN TILLS.

1. Record being permanent is as good a check a week afterwards as the moment record is made.
2. All records being in assistants' own handwriting, and as an increased security can be initialed or numbered.
3. Safest Cash Book, name and amount of debt paid being recorded, thus placing beyond dispute or annoyance by rendering an account already paid.
4. Bell rings and paper moves forward each time drawer is opened, hence drawer cannot be opened without its being known.
5. Cash in drawer must agree with total of records, otherwise theft or error in giving change has taken place.
6. It shows the number of customers waited upon by each assistant.
7. Is an incentive to assistants to do their cashing correctly.
8. Is a friend to you and your assistant: his friend by relieving him of all suspicion; your friend by informing you of every penny taken.
9. Relieves assistant of temptation of Open Tills.
10. Saving of time when used as a Cash Book.
11. Employer being enabled to prove truthfulness of record.
12. Customers returning to exchange goods test accuracy of record, this registering system being the only system in the market giving this advantage, which is one of the most valuable means by which errors are detected.
13. Each Till has only to display a deficiency of 2d. per week, either from errors in giving change or other causes, to return 15 per cent. on outlay.

SENT ON TRIAL SEVEN DAYS (CARRIAGE PAID IF PURCHASED).

FULL PARTICULARS ON APPLICATION TO

G. R. STOKES & CO., LIM., HANLEY.

R. H. BARRETT'S NEW PATENT BOTTLE.

THE ONLY REALLY PERFECT CAPPED BOTTLE FOR VASELINE, POMADE, DRY POWDERS, &c.

PRICES (in 5-gross Lots):—Fitted with STRONG METAL CAPS, CORK-LINED, in various colours, very attractive in appearance—1 oz., 12/; 1½ oz., 13/; 2 oz., 13/6; 3 oz., 16/; 4 oz., 18/ per gross.

Fitted with best BOXWOOD CAPS—1 oz., 15/6; 1½ oz., 16/6; 2 oz., 17/6; 3 oz., 21/6; 4 oz., 24/6 per gross.

Chemists' and Perfumers' Bottles in great variety, Plain or Stoppered. Orders may be sent to the PRINCIPAL WHOLESALE HOUSES.

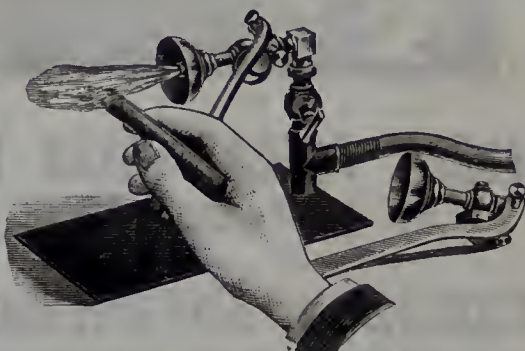
R. H. BARRETT, FLINT GLASS BOTTLE WORKS, THE OVAL, CAMBRIDGE HEATH, LONDON, E.

Telegraphic Address—"FOREFRONT LONDON."

[2]

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Adapted by The Apothecaries Hall, and
leading Chemists, Stationers, and
Tobaccoconists.
Great saving in Gas and Labour.



QUITE NEW.

SINCLAIR, TWEEDIE & CO., 13 ELDON STREET, LONDON, E.C.

DISPENSING BOTTLES & PHIALS

GREAT SAVING in the purchase of the above by taking not less than 6 gross of assorted sizes:—

	Per Gross.		Per Gross.
3 & 4 oz., Plain or Graduated	7/6	1-oz. Phials	3/6
6 & 8 oz. "	8/6	1-oz. "	3/9
12-oz. "	12/-	1½-oz. "	4/3
		2-oz. "	5/3

Country packages, 1/ each, allowed for if returned. All other sizes and kinds equally low.

I. ISAACS & CO.

GLASS BOTTLE MANUFACTURERS.
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BANKERS: LONDON AND WESTMINSTER BANK.

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That fulfils ALL the requirements of the POST OFFICE.



Is fastened INSTANTLY.
Cannot open by accident.
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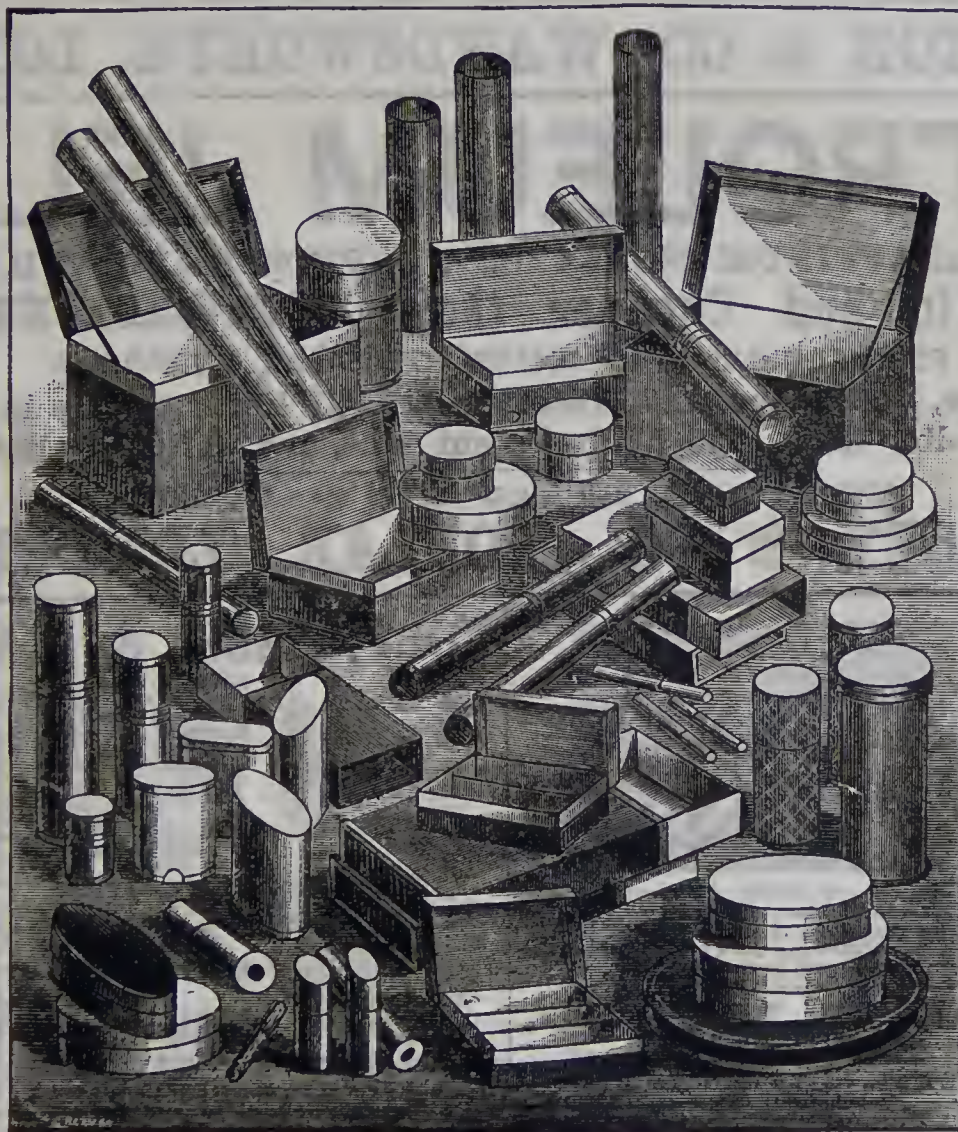
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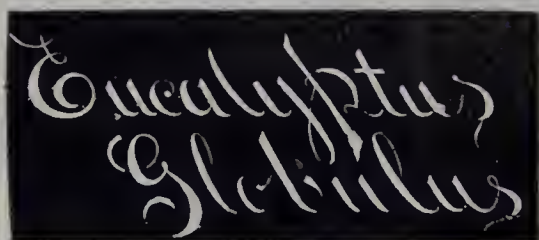
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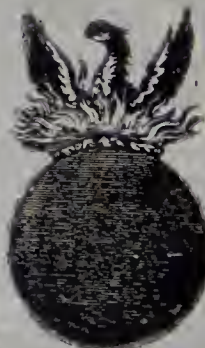


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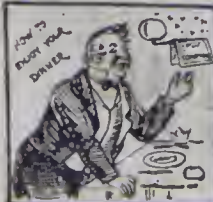
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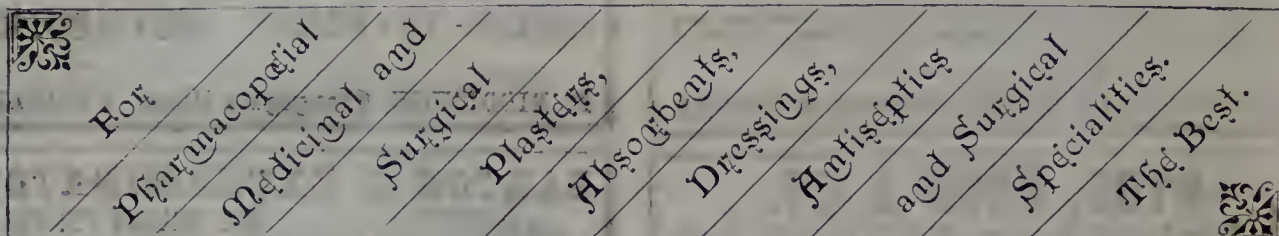
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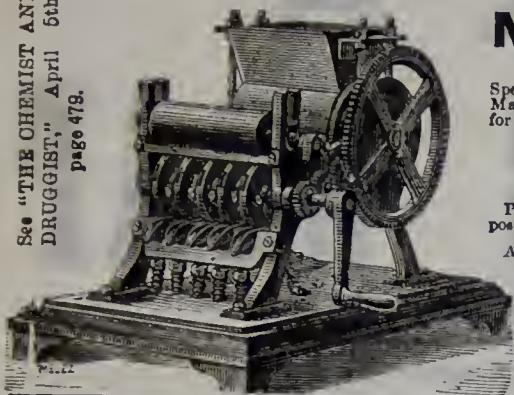
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See "THE CHEMIST AND
DRUGGIST," April 5th,
page 479.



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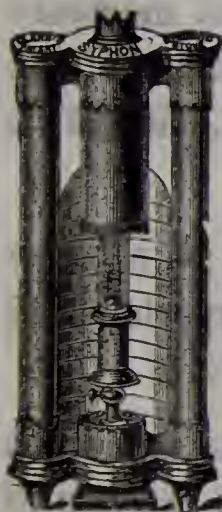
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